## LESSON SUMMARY FOR: DATE STARTED:   DATE COMPLETED:

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<tr>
<th>SECTION</th>
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</table>
| Calculating perimeter, area and volume | Calculating perimeter for rectangle, triangles, circles, polygons using formulas | House hold, school and wider community | Learners should be able to:  
  - Measure objects using a ruler  
  - Use a formula to calculate perimeter of rectangle, triangles, circles (including semi-circles, quarters and three quarters)  
  - Determine appropriate quantities of materials/ components needed to complete a task |

### TEACHER ACTIVITIES

1. **Teaching methods**  
   Question and answer, Discussion, demonstration

2.1 **Introduction**  
   a. Pre-knowledge required for the lesson  
      - Knowledge of measuring perimeter  
      - Knowledge of different shapes and how to calculate the perimeter  
   b. Baseline assessment:  
      Seen under learner activity

2.2 **Main Body (lesson presentation)**  
   - Explain to learners what the terms in baseline assessment mean  
   - Remind the learners of what is the perimeter: the total distance around a shape or an object. That is the total distance around the edges defining the outline of that shape.  
   - Explain to learners that every shape has a perimeter, it could be a circle, or it could be rectangle. To calculate perimeter, add all the sides of the shape, which is adding together the length of each side of the shape.  
   - Remind learners that the perimeter of a circle is called the circumference  
   - Remind learners about the formulas to calculate perimeter of basic shape i.e. rectangle, circle, triangle

### LEARNER ACTIVITIES

#### Baseline: assessment  
1. For this activity you will need a ruler or a tape measure.  
2.1 Measure the perimeter of your Mathematical literacy writing book (exercise book or note book)  
2.2 Measure the perimeter of your desk (top part of the desk).  
2.3 Measure the perimeter of this shape in cm using the ruler:

#### Activity  
1. Find the circumference of a ¼ a pizza if the diameter of the pizza is 23 cm  
2. An athletic track is made of a rectangle in the middle and two semi-circles at the ends. There is a path of 1 m width around the track.

### TIMING

<table>
<thead>
<tr>
<th>RESOURCES NEEDED</th>
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</table>
| Newspapers  
Calculators  
Magazines  
chalkboard |

### RESOURCES NEEDED
• Inform learners that in real life, the word perimeter is not always used but the following words can be used: calculate the **length** of the fence, or **how much** fence will be needed or **how many** meters of fence will be needed, or **how much tread will be needed to decorate a table cloth**.
• Look under learner activity for some suggested questions. You may include your own.
• Move round in the classroom while learners are working to monitor their progress and assist where needed.

### 2.3 Conclusion

• Summarise the lesson and make clarifications where needed

• Give learners home work on the lesson presented

<table>
<thead>
<tr>
<th>Shape</th>
<th>Triangle</th>
<th>Rectangle</th>
<th>Circle</th>
</tr>
</thead>
<tbody>
<tr>
<td>Formula</td>
<td>P = s + s + s</td>
<td>P = 2 (l + b)</td>
<td>P = d \times \pi</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>P = 2 \times r \times \pi</td>
</tr>
</tbody>
</table>

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- a. Calculate the circumference of one of the semi-circles
- b. Calculate the perimeter of the total track
- c. The athletic club manager wants to erect a fence one metre from the tract (on the outside perimeter of the path). Calculate how many metres of fence he will have to buy.

3. A computer desk has a length of 70cm and a breath of 40cm.

- a. Work out the perimeter of the computer desk.

The length of a wall in a computer classroom is 15m. How many computer desks can be placed side-by-side along the wall?
<table>
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<th>Reflection/Notes:</th>
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<tbody>
<tr>
<td>calculation of semi-circle</td>
</tr>
<tr>
<td>Calculation of (\frac{1}{4}) circle</td>
</tr>
<tr>
<td>Calculation of third of a circle</td>
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| Calculating perimeter, area and volume | Calculating perimeter for rectangle, triangles, circles, polygons using formulas | House hold, school and wider community | Learners should be able to:  
- Measure objects using a ruler  
- Use a formula to calculate perimeter of rectangle, triangles, circles (including semi-circles, quarters and three quarters)  
- Determine appropriate quantities of materials/ components needed to complete a task |

**TEACHER ACTIVITIES**

1. **Teaching methods**
   - Question and answer, Discussion, demonstration

2.1 **Introduction**
   a. Pre-knowledge required for the lesson
      - Knowledge of measuring perimeter
      - Knowledge of different shapes and how to calculate the perimeter
   b. Baseline assessment:
      - Do correction to the homework

2.2 **Main Body (lesson presentation)**
   - Tell learners that perimeter does not only apply to basic shapes, but it includes other polygon shapes.
   - Explain to learners that polygon refers to a shape that has more than four sides. Some shapes are a combination of two to three shapes.
   - Remind learners about the characteristics of shapes i.e. triangle, square, rectangle, circle.
   - Show learners how to calculate a perimeter when one side is not measured or indicated

**LEARNER ACTIVITIES**

<table>
<thead>
<tr>
<th>Activity</th>
</tr>
</thead>
<tbody>
<tr>
<td>1. Work out the perimeter of a triangular piece of chocolate with the length of one side equal to: [NB: all sides are equal]</td>
</tr>
</tbody>
</table>
| a. 25 mm  
| b. 35 mm  
| c. 6 cm |
| 2. Yoliswa wants to put Christmas light decoration around the front part of the house and its windows as shown below: |

```
2,6m  
0,6m  
1,2m  
0,6m  
5m  
```

| a) Calculate the perimeter of the roof [all sides are equal] |

**TIMING**

| Baseline: 10 min  
| Activity: 45 min  
| Conclusion: 5 min |

**RESOURCES NEEDED**

- Newspapers
- Calculators
- Magazines
- chalkboard
\[ a = 2 \text{ m} \text{ the sides of the triangle are equal to each other} \]
\[ b = 3 \text{ m} \text{ opposite side of the rectangle are equal to each other} \]
\[ c = 2 \text{ m} \text{ opposite side of a rectangle (the opposite side of the of the rectangle is the same length as the side of the triangle, and the sides of the triangles are equal to each other)} \]

**Step 2: add all the outside sides of the shape**

\[ P = 3 + 2 + a + b + c \]
\[ P = 3 + 2 + 2 + 3 + 2 \]
\[ P = 12 \text{ m} \]

- Remind the learners of what is the **perimeter** the total distance around a shape or an object. That is the total distance around the edges defining the outline of that shape.
- Explain to learners that every shape has a perimeter, it could be a circle, or it could be rectangle. To calculate perimeter, add all the sides of the shape, which is adding together the length of each side of the shape.
- Inform learners that in real life, the word perimeter is not always used but the following words can be used: calculate the **length** of the fence, or how much fence will be needed or how many meters of fence will be needed, or how much **tread** will be needed to decorate a table cloth.
- Look under learner activity for some suggested questions. You may include your own.
- Move round in the classroom while learners are working to monitor their progress and assist where needed.

### 2.3 Conclusion

- Summarise the lesson and make clarifications where needed
- Give learners home work on the lesson presented

**b)** Calculate the perimeter of the windows which are identical

**c)** Calculate the perimeter of the rectangular part of the house

**d)** Calculate the total perimeter of the house that will be covered by the lights?

### Homework

The two letters F, E are to appear on the notice board, representing an abbreviation for Final Exam. Their measurement are given in cm

![](image)

A silver beadings needs to be placed along the outer edge of the letters

- What is the total length of beading required?
- If the beading is sold in metres, how many metres must be bought?
**LESSON SUMMARY FOR: DATE STARTED:**

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<td>Calculating perimeter for rectangle, circles, polygons using formulas</td>
<td>House hold, school and wider community</td>
<td>Learners should be able to:</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>• Use a formula to calculate perimeter of rectangle, circles (including semi-circles, quarters and three quarters)</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>• Determine appropriate quantities of materials/ components needed to complete a task</td>
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</table>

**TEACHER ACTIVITIES**

1. **Teaching methods:**
   - Question and answer, Discussion, demonstration

2.1 **Introduction**
   a. Pre-knowledge required for the lesson
      - Knowledge of measuring perimeter
      - Knowledge of different shapes and how to calculate the perimeter
   b. Baseline assessment:
      - Do correction to the home work

2.2 **Main Body (lesson presentation)**
   - Tell learners that perimeter does not only apply to basic shapes, but it includes other polygon shapes.
   - Explain to learners that polygon refers to a shape that has more than four sides. Some shapes are a combination of two to three shapes.
   - Tell learners that in this lesson we will focus on circle, semi – circle, quarter circle etc. we are going to look at how we calculate the perimeter of the circle alone and when it is mixed with other shapes.
   - Tell learners that the perimeter of the circle is called a circumference
   - Provide learners with these formulas that show how to calculate the perimeter of different shapes of the circle

**LEARNER ACTIVITIES**

**Activity**

1. A mirror window has the following dimension:

   ![Diagram of a mirror window with dimensions 80cm and 90cm]

   a) What is the length of the radius of the semi-circle part of the mirror?
   b) Work out the circumference of the semi-circle of the mirror
   c) Calculate the perimeter of the rectangular part of the mirror
   d) Calculate the total perimeter of the mirror

2. The traffic circle at voortreker in Alberton has a radius of 30m.

**TIMING**

Baseline: 10 min
Activity: 45 min
Conclusion: 5 min

**RESOURCES NEEDED**

- Newspapers
- Calculators
- Magazines
- Chalkboard
Show learners how to calculate the perimeter of the shape below (netball court):

To calculate the perimeter of this shape:

Step 1: calculate the perimeter of the rectangle

\[ P = 2(l + b) \]

\[ = 2(8 + 4) \]

\[ = 24 \text{ m} \]

Step 2: calculate the circumference of the semi-circle and the circle (we have a diameter, so use the formula with the diameter)

\[ C(\text{semi-circle}) = \pi \times \frac{d}{2} \]

\[ = \pi \times 4 \]

\[ = 6.28 \text{ m} \]

There are two semi-circle times the answer by 2

\[ C(\text{semi-circles}) = 2 \times 6.28 \]

\[ = 12.56 \text{ m} \]

\[ C(\text{circle}) = \pi \times \frac{d}{2} \]

\[ = \pi \times 1 \]

\[ = 3.14 \text{ m} \]

Step 3: calculate the total perimeter

\[ \text{Total} = 24 + 12.56 + 3.14 \]

\[ = 39.7 \text{ m} \]

Look under learner activity for some suggested questions. You may

a. Work out the circumference of the traffic circle?

b. How far will Zintle travel if she travels third around the circle?
•include your own.
  Move round in the classroom while learners are working to monitor their progress and assist where needed.

2.3 Conclusion
• Summarise the lesson and make clarifications where needed
• Give learners home work on the lesson presented

Reflection/Notes:

Name of Teacher: 

HOD: 

Sign: 

Sign: 

Date: 

Date:
**Lesson Summary**

**Lesson Objective**

Learners should be able to:
- Use a formula to calculate perimeter of rectangle, circles (including semi-circles, quarters and three quarters)
- Determine appropriate quantities of materials/ components needed to complete a task

**Context**

Household, school and wider community

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<tbody>
<tr>
<td>Calculating perimeter, area and volume</td>
<td>Calculating perimeter of polygons using formulas</td>
<td>Household, school and wider community</td>
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</table>

**Teacher Activities**

1. **Teaching methods**
   - Question and answer, Discussion, demonstration

2.1 **Introduction**
   
   a. Pre-knowledge required for the lesson
      - Knowledge of measuring perimeter
      - Knowledge of different shapes and how to calculate the perimeter
   
   b. Baseline assessment:
      - Do correction to the homework

2.2 **Main Body (lesson presentation)**

   - Tell learners that calculating a perimeter shape can be applied to daily lives.
   - Explain to learners that in everyday life we also find out the quantity needed and the amount it cost.
   - Tell learners that calculating the perimeter help to find the quantity of the material need to build or complete a task i.e. building a fence using cast wall or using railings or using wire fence or chain link fence that means also need poles to hold the fence.
   - Show learners the pictures of types of walls

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<td><strong>Activity</strong></td>
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<td></td>
</tr>
<tr>
<td>1. Albert is building a rectangular fence around his garden, using balustrades (wooden rail) each balustrades measure 1.5 m. The rectangular shape has the side of 30m and 42m.</td>
<td>Baseline: 10 min</td>
<td>Newspapers</td>
</tr>
<tr>
<td>a. Work out the perimeter of the garden</td>
<td>Activity: 45 min</td>
<td>Calculators</td>
</tr>
<tr>
<td>b. Workout how many balustrades Albert has to order</td>
<td></td>
<td>Magazines</td>
</tr>
<tr>
<td>c. The balustrades are delivered in packs of 10. How many packs of balustrades must he order</td>
<td></td>
<td>chalkboard</td>
</tr>
<tr>
<td>d. Each pack of balustrades cost R330.00. How much will the balustrades cost?</td>
<td>Conclusion: 5 min</td>
<td></td>
</tr>
<tr>
<td>2. An athletic track is made of a rectangle in the middle and two semi-circles at the ends. There is a path of 1m width around the track.</td>
<td></td>
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</tr>
</tbody>
</table>
Show learners how to calculate the quantity and the cost for the material

James school want to fence the play area with a palisade fence. The playground is a rectangle with the length of 10m and a breath of 6m. The width of each palisade bar is 1.5m and the cost of each palisade is R20.67 per metre.

1. Calculate the circumference of one of the semi-circles
2. Calculate the perimeter of the total track
3. The athletic club manager wants to erect a fence one metre from the tract (on the outside perimeter of the path). Calculate how many metres of fence he will have to buy.
4. The fence must be supported by poles planted three metre apart. How many poles are needed?
5. If he pays R115.95 per running metre of fencing, what is the cost of fence.
6. If one pole cost R15.20. Calculate the total cost for the whole project of fencing.

a) What is the length of the radius of the semi-circle part of the mirror?

b) Work out the circumference of the semi-circle of the mirror

c) Calculate the perimeter of the rectangular part of the mirror

d) Calculate the total perimeter of the mirror

3. The traffic circle at voortreker in Alberton has a radius of 30m.
Calculate how much it will cost fence this play ground.

Step 1: calculate the perimeter of the rectangle
\[ P = 2(10 + 6) \]
\[ = 2 \times 16 \]
\[ = 32 \text{ m} \]

Step 2: calculate the quantity of palisades bar, how many palisade bars

\[
\text{No. of palisades} = \frac{32}{1.5} = 21.33
\]
(we cannot buy a 0.33 bar. The builder will have to cut the bar to fit the potion, this means need to buy an extra bar)

\[ = 22 \text{ palisades} \]

Step 3: calculate the cost of palisades

\[ \text{Total} = 22 \times R20.67 \]
\[ = R454.74 \]

- Look under learner activity for some suggested questions. You may include your own.
- Move round in the classroom while learners are working to monitor their progress and assist where needed.

2.3 Conclusion

- Summarise the lesson and make clarifications where needed
- Give learners homework on the lesson presented

g. Work out the circumference of the traffic circle?

h. How far will Zintle travel if she travels third around the circle?
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<td>Learners should be able to: • Measure objects using a ruler • Use a formula to calculate perimeter of rectangle, triangles, circles (including semi-circles, quarters and three quarters) • Determine appropriate quantities of materials/ components needed to complete a task</td>
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**TEACHER ACTIVITIES**

1. **Teaching methods: Question and answer, Discussion, demonstration**

2.1 **Introduction**

a. Pre-knowledge required for the lesson
   - Knowledge of measuring perimeter
   - Knowledge of different shapes and how to calculate the perimeter

2.2 **Main Body (lesson presentation)**

- Remind the learners of what is the perimeter, the total distance around a shape or an object. That is the total distance around the edges defining the outline of that shape.
- Remind learners that the perimeter of a circle is called the circumference.
- Provide learners with the formulas to calculate perimeter.

<table>
<thead>
<tr>
<th>Shape</th>
<th>Triangle</th>
<th>Rectangle</th>
<th>Circle</th>
<th>Formula</th>
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<td>P = d x π</td>
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<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td>P = 2 x r x π</td>
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</table>

- The issue out write the questions on the chalkboard.
- If you have access to a printer, then make copies and hand them out to the learners.

<table>
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<tr>
<th>LEARNER ACTIVITIES</th>
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<tbody>
<tr>
<td><strong>Activity</strong></td>
</tr>
<tr>
<td>1. The picture below shows the dimension of a piece of land that Musa own.</td>
</tr>
</tbody>
</table>

![Diagram of land dimensions](image)

Calculate how much fencing Musa will need to erect a fence around the land. (5)

2. The girls in Sebokeng high are very keen netball players. During this year their performance improved a lot. The dimensions of the netball court are given below. The length of the court is 30.5 m and the width of the is 15.25 m.

![Diagram of netball court dimensions](image)

a. During practice the girls have to run around the court a few times. Calculate the distance that girls must run to complete one round. (3)
• Encourage the learners to write the work under examination conditions

• You may mark on your own or swap their answer scripts and let them do peer marking while you display the suggested solutions on the chalkboard.

• After marking, discuss with learners challenges they may have faced while solving the questions.

• Refer learners to textbooks where they can get the opportunity to practice further on their own.

• Move round in the classroom while learners are working to monitor their progress and assist where needed.

2.3 Conclusion
• Summarise the lesson and make clarifications where needed

b. 

![Diagram]

- Run off – clear: 20.5
- 36.6 m
- 15.25 m
- 21.35 m

b. The inner edge of the swimming pool is finished with a specific type of the stones, which cost R295 per metre. Calculate the cost to buy these stones. (6)

c. There is a run-off space of 3.05 m wide all around the netball court. Calculate the perimeter of the run-off space. (4)

d. The caretaker has to paint all the lines on the court with white paint. Determine the total length of the lines. (6)

3. The drawing shows a swimming pool. Around the swimming pool paving is laid, and the fence is built along the edges of the paving. All measurements are given in m.

![Diagram]

a. The inner edge of the paving (along the swimming pool) is finished with a specific type of the stones, which cost R295 per metre. Calculate the cost to buy these stones. (6)

Determine the length of the fencing around the outer edge of the paving. Remember 1 m is occupied by a gate. (6) [total = 30]
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**Grade 11 Mathematics Literacy Lesson Plans**

**Week 2**

**Topic:** Measurement (perimeter, area and volume)

**Time:** 60min

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### Lesson 1

**Lesson Summary**

- **Content:** Calculating perimeter, area and volume.
- **Context:** Household, school and wider community.
- **Objective:** Learners should be able to:
  - Calculate the total area of a shape.
  - Calculate values to accommodate measurement error.
  - Determine appropriate quantities of materials/components needed to complete a task.

### Teacher Activities

1. **Teaching methods:**
   - Telling, explaining, question and answers, demonstration.

2.1 **Introduction**
   - a. Pre-knowledge required for the lesson properties of a rectangle, square, circle.
   - b. Baseline assessment.
     - Draw shapes A, B, C from the lesson presentation on the board. Ask learners the questions written under baseline assessment in the learner activities column.

2.2 **Main Body (Lesson presentation)**
   - Inform learners that certain products when produced need to be packaged, and this needs to be considered in your budget. You need to decide on the shape of the package i.e. round, square or triangle.
   - Tell learners that when packaging, we are dealing with area. The amount of space inside a flat surface. Area is measured in square units.
   - Provide learners with some context where area applies e.g. vegetable garden, fencing the yard, tiling a room, painting a room etc.
   - Show learners how to calculate the area of different shapes:

<table>
<thead>
<tr>
<th>Shape</th>
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</tr>
</thead>
<tbody>
<tr>
<td>A</td>
<td>B x H</td>
</tr>
<tr>
<td>B</td>
<td>0.5 x b x h</td>
</tr>
<tr>
<td>C</td>
<td>(\pi r^2)</td>
</tr>
<tr>
<td>D</td>
<td>0.5 x b x h + (l x d)</td>
</tr>
</tbody>
</table>

   - **Area Calculations:**
     - A = 2x3 = 6m²
     - B = 0.5 x 5 x 6 = 15 m²
     - C = \(\pi x 3^2\) = 28.27 m²
     - D = (0.5 x 5 x 3) + (4 x 4) = 32 m²

### Learner Activities

- **Baseline assessment:**
  - a. Name the shapes below.
  - b. Write two properties pertaining to the sides of the each shape.

2. **Activity:**
   - Calculate the total length of this farm.
     - Add your dimensions.

2.1 **Calculate the total length of this farm.**

2.2 **Add your dimensions**
   - a. Calculate the area covered by the round biscuits and the area not covered.
   - b. Calculate the area not covered by the biscuits.

3. **Home work**
   - a. Calculate the area of the shaded part for the shapes below.
   - b. Calculate the length of the un-shaded part.

---

**Resources Needed:**
- Newspapers
- Calculators
- Magazines
- Chalkboards

**Timing:**
- Baseline: 10 min
- Activity: 45 min
- Conclusion: 5 min
Inform learners that you also need to know how much you are going to pack or place on the base. The place of the base is the area.

The value of pi will be given in tests and examinations. 3.14 is commonly used.

Demonstrate to learners that when you have two shapes in one picture you calculate their area separately then add them or subtract them i.e. calculate the area of the shaded part

\[ A_{\text{shaded}} = A_{\text{rectangle}} - A_{\text{circle}} \]

Do corrections

**Reflection/Notes:**
### Grade 11 Mathematics Literacy Lesson Plans

**Measurement (perimeter, area and volume)**

**Time:** 60min

**Lesson 2**

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<tr>
<td>Calculating perimeter, area and volume</td>
<td>Calculate area of any shape</td>
<td>House hold, school and wider community</td>
<td>Learners should be able to:</td>
</tr>
<tr>
<td></td>
<td>Conversion in squares</td>
<td></td>
<td>- calculate the area of any shape and convert from one unit measure to another</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>- calculate the cost of quantity needed</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>- Determine appropriate quantities of materials/ components needed to complete a task</td>
</tr>
</tbody>
</table>

### LEARNING ACTIVITIES

#### Teacher Activities

1. **Teaching methods:**
   - Telling, explaining, question and answers, demonstration

2. Prepare a lesson and consider the following:

2.1 **Introduction**
   - a. pre-knowledge required for the lesson calculate area of different shapes, identify different shapes, calculating surface area
   - b. baseline assessment
   - do homework corrections

2.2 **Main Body (Lesson presentation)**
   - Inform learners that packaging also involves also knowing the quantity to be packed and the cost.
   - Explain to learners that when packaging the items packed could be having a different shape from the container packed in. e.g. tin of cans in a square box.
   - Tell learners that the items packed could have different units. This means that before you could find the quantity, you need to convert from one unit measure to another.
   - Provide learners with the following basic conversion table, showing how to convert an area from one square metre to another square meter.

<table>
<thead>
<tr>
<th>To convert</th>
<th>To</th>
<th>multiply</th>
<th>Or</th>
</tr>
</thead>
<tbody>
<tr>
<td>cm²</td>
<td>mm²</td>
<td>(10)²</td>
<td>10 x10 = 100</td>
</tr>
<tr>
<td>m²</td>
<td>cm²</td>
<td>(100)²</td>
<td>100 x 100 = 10 000</td>
</tr>
<tr>
<td>km²</td>
<td>m²</td>
<td>(1000)²</td>
<td>1000 x 1000 = 1000 000</td>
</tr>
</tbody>
</table>

   - Explain to learners that if you were to convert the units back to what the other, then you will divide with the same factor that you multiply with i.e. mm² to cm² you will divide 10x10 (100)
   - Tell learners that when converting, we multiply because the measurement converting from is bigger i.e. km is bigger than metres.

3. Explain to learners that if you were to convert the units back to what the other, then you will divide with the same factor that you multiply with i.e. mm² to cm² you will divide 10x10 (100)

4. Tell learners that when converting, we multiply because the measurement converting from is bigger i.e. km is bigger than metres.

#### Learner Activities

1. **Activity:**

1. Calculate the area of a rectangular paddock with the length of 70m and a width of 40m
2. A lid of a rectangular pencil with a length of 250mm and a width of 120mm. write your answer in cm².
3. Zanele and Jan e make cupcakes to raise funds for their school. They pack the cakes into a box with area of 256m². The diameter of each cup cake is 4 cm. how many cupcake are they able to fit into one box.
4. Karabo have a vegetable garden that is 5,4m by 3,8 m a. Calculate the area of Karabo’s garden b. Work out the area Karabo needs if she wants to plant 1/3 of her garden with carrots c. Work out the area Karabo needs if she wants to plant ½ of her garden with cabbages d. Find out how much space is she left with to plant her lettuce

#### Conclusion

**Home work**

Thabiso plans to tile his lounge and dining room. He measures the floor and write down the following measurement:

- Calculate the total floor area to be tiled.

---

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We divide because the measurement converted from is smaller i.e. cm to metre.

- Demonstrate to learners how to calculate quantity and cost and how to convert from one unit to another

Siyafunda's floor is 500cm long and 320 cm wide. He want to cover his floor with a wooden floor.

a. Calculate the area of the floor in m².

\[
A = 500 \times 320 \\
= 160000 \text{ cm}^2 \quad (\text{need to change cm}^2 \text{ to m}^2, \text{we divide 10 000}) \\
A = 160000 \div 10 000 \\
A = 16 \text{ m}^2
\]

b. The wood is packed in boxes of 1.2 m². How many boxes will he need?

\[
\text{Boxes} = 16 \div 1.2 \\
= 13.9 \text{ boxes} \quad (\text{you cannot buy a 0.9 box, you will need a full box to cover the 0.9 area})
\]

c. Calculate the cost of the wood, if 1 box costs R375.00

\[
\text{Cost} = 14 \times 375,00 \\
= R 5 250,00.
\]

1. Calculate the area of the bar code sticker (4cm length and 3cm width) \( A = 4 \times 3 = 12 \text{ cm}^2 \)

2. Calculate the surface area of the can (exclude the top and the bottom) \( SA = 2\pi rh = 2\pi \times 3 \times 11 \)

\[
= 622,035 \text{ cm}^2 
\]

3. How much area of the can is covered by the red plastic sheet? \( SA = 622,035 - 12 \approx \text{ cm}^2 \)

- Inform learners that surface area is also used at homes when painting the house or tiling the house.
- Demonstrate to learners how to calculate surface area of the portion to be decorated or painted. Use the classroom as an example i.e. to tile the wall and the floor of the class. The area of the windows have to be calculated, area of the door has to be calculated, the area of the chalkboard has to be calculated, the surface area of the class excluding the ceiling. Indicate to the learners that the chalkboard, windows and the door are not going to be tiled but they were included in the calculation of the class surface area. Subtract them from the surface area of the class that will give you the surface area to be tiled.

b. The tiles are sold in boxes. Each box of tile covers 1.08m². How many boxes will he need to buy?

c. The tiles R245 per box. Calculate the cost of tiles.

d. How many m² of tiles will be delivered
• Do correction to the activity

2.3 Conclusion
Remind learners that surface area is about calculating the area of different shapes that are combined to create an object

Reflection/Notes:

Name of Teacher:

HOD:

Sign:

Sign:

Date:

Date:
# Grade 11 Mathematics Literacy Lesson Plans

## Grade 11 Mathematics Literacy

### Measurement (perimeter, area and volume)

**Time:** 60 min

**Lesson 3**

---

<table>
<thead>
<tr>
<th>LESSON SUMMARY FOR: DATE STARTED:</th>
<th>DATE COMPLETED:</th>
</tr>
</thead>
<tbody>
<tr>
<td>BACK</td>
<td>BACK</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>SECTION</th>
<th>CONTENT</th>
<th>CONTEXT</th>
<th>APPLICATION / LESSON OBJECTIVES</th>
</tr>
</thead>
<tbody>
<tr>
<td>Calculating perimeter, area and volume</td>
<td>Work with relationships where there is calculating surface area for rectangle box, triangular prism, cylinder, using formulas</td>
<td>House hold, school and wider community</td>
<td>Learners should be able to:</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>• calculate the area of different shapes that makes up a prism</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>• calculate the total surface of a prism</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>• Determine appropriate quantities of materials/ components needed to complete a task</td>
</tr>
</tbody>
</table>

---

### TEACHER ACTIVITIES

#### 1. Teaching methods:
- Telling, explaining, question and answers, demonstration

#### 2.1 Introduction
- **a.** pre-knowledge required for the lesson calculate area of different shapes, identify different shapes
- **b.** baseline assessment
  - do correction of the homework
  - do correction of the base line assessment

#### 2.2 Main Body (Lesson presentation)

- Show learners different containers of packaging shapes, ask learners to show the shapes they brought, i.e.
  - Inform learners that these shapes are called prisms
  - Define the three types of prism i.e. circular, right, triangular and rectangular prism,
  - Indicate to the learners each prism is named based on its base, and all prisms have height
  - Explain to the learners that to calculate how much material is used to create the box, you have to calculate the area of each side then add them together.[this is called the surface area]
  - Demonstrate to the learners the surface areas of the three prisms by showing them the net of each prism

---

### LEARNER ACTIVITIES

#### 1. Baseline assessment:

<table>
<thead>
<tr>
<th>面</th>
<th>長</th>
<th>高</th>
</tr>
</thead>
<tbody>
<tr>
<td>2m</td>
<td>2m</td>
<td>1.5m</td>
</tr>
</tbody>
</table>

The figure represents a box, opened up. Calculate the area of each shape

#### 2. Activity:

- **a.** Ask learners to calculate the surface area of the cylinder they have brought i.e. can of coke
- **b.** Calculate the surface area of the rectangular prism (box of powder soap or cereals)

#### 3. Home work

Give learners home work on triangular prism and cubes from any book.

---

### TIMING

- Baseline: 10 min
- Activity: 45 min
- Conclusion: 5 min

### RESOURCES NEEDED

- Newspapers
- Calculators
- Magazines
- chalkboard
• Indicate to them that to calculate the Surface area of:
  - cylinder = area of the circle + [circumference x height] \[ 2\pi r^2 + 2\pi rh \]
  - rectangular prism = 2 (lb+lh+bh)
  - triangular prism = area of 2 triangle + area of 2-side rectangle + area of third rectangle \[ 2 \left( \frac{1}{2}bh \right) + 2(lh) + (lx) \]

**2.3 Conclusion**
Summarize the key points on how to calculate surface area and the key distinctions of the prisms

**Reflection/Notes:**

<table>
<thead>
<tr>
<th>Name of Teacher:</th>
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<tbody>
<tr>
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<tr>
<td>Date:</td>
<td>Date:</td>
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</table>
## Lesson Summary for: Date Started: 
### Date Completed:

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<td>Household, school and wider community</td>
<td>Learners should be able to:</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>• calculate the total surface area of a prism</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>• Calculate values to accommodate measurement error</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>• Determine appropriate quantities of materials/ components needed to complete a task</td>
</tr>
</tbody>
</table>

### Teacher Activities

1. **Teaching methods**
   - Telling, explaining, question and answers, demonstration

2.1 **Introduction**

   a. Pre-knowledge required for the lesson calculate area of different shapes, identify different shapes
   b. Baseline assessment
   - Do correction of the homework

2.2 **Main Body (Lesson Presentation)**

   - Tell learners that surface area helps at finding the quantity of paint that need to be bought. In order to know how much paint you need to buy, you need to know the total area to be painted.
   - Explain to learners that the quantity of paint is in liquids, and the surface area is in square meters. This means that you need to convert from m² to litres.
   - Tell learners that different paints have different thickness. The amounts of paint you use depend on how thick you paste the paint on the wall or material.
   - Explain to learners that when you buy paint, in its container you are told how much area it will cover. In some instances they even indicate how much area a litre of paint covers. For example:

<table>
<thead>
<tr>
<th>Type of paint</th>
<th>Coverage (per litre)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Wood Primer</td>
<td>9 m²</td>
</tr>
<tr>
<td>Acrylic</td>
<td>10 m²</td>
</tr>
<tr>
<td>Undercoat</td>
<td>7 m²</td>
</tr>
</tbody>
</table>

   - Remind learners that paints when they are brought they do come in decimals, the quantity is in whole numbers i.e. 2l, 5l, 20l

### Learner Activities

1. **Activity:**
   - This activity is on the 4th page.

### Timing

Baseline: 10 min
Activity: 45 min
Conclusion: 5 min

### Resources Needed

- Newspapers
- Calculators
- Magazines
- Chalkboard

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- Demonstrate to learners how to calculate the amount of paint using surface area and finding the cost.

The dimensions below are of the room build outside Sizi’s house.

<table>
<thead>
<tr>
<th>Room</th>
<th>Door</th>
<th>Window</th>
</tr>
</thead>
<tbody>
<tr>
<td>Length = 4m</td>
<td>Height = 2,1m</td>
<td>Length = 1,6m</td>
</tr>
<tr>
<td>Breath =3,5m</td>
<td>Width = 0,9m</td>
<td>Breath = 1m</td>
</tr>
<tr>
<td>Height = 3m</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

a. Calculate the total surface area that needs to be painted.

\[
SA = 2 (l \times h) + 2 (b \times h) \\
= 2 (4 \times 3) + 2 (3.5 \times 3) \\
= 24 + 21 \\
= 45 \text{ m}^2 \\
\]

\[
A (door) = 2,1 \times 0,9 \\
= 1,89 \text{ m}^2 \\
A (room) = 1,6 \times 1 \\
= 1,6 \text{ m}^2 \\
\]

\[
SA (Total) = 45 - 1,6 - 1,89 \\
= 41,51 \text{ m}^2 \\
\]

b. How many litres of paint should she buy, if 1l of paint covers 9m²?

\[
1l : 9m^2 \\
This means = 41,51/9 \\
= 4,61l \\
\]

2.3 Conclusion

Summarize the key points on how to calculate surface area and the key distinctions of the prisms.

- Give learners home work on the lesson presented.
Class activity

a. Thami wants to paint the roof and the house of his dog. How much paint would she need if she will paint using enamel? 1 litre covers 7.5 m². The picture of the dog’s house and its 2-D shape are shown above.

b. As a result of load shedding, Wayne, a chicken farmer, goes back to using a generator to provide dependable power for his chicken sheds and his farmhouse. He buys a second-hand diesel tank with a radius of 1 m and a length of 2 m to store the fuel for the generator.

1. He decides to paint the outside surface area of the tank. It takes 1 l paint to paint 3 m² of the surface. Calculate the surface area of the tank and the quantity of paint needed.
**LESSON SUMMARY FOR: DATE STARTED:**

<table>
<thead>
<tr>
<th>SECTION</th>
<th>CONTENT</th>
<th>CONTEXT</th>
<th>APPLICATION / LESSON OBJECTIVES</th>
</tr>
</thead>
</table>
| Calculating perimeter, area and volume | Calculate volume for 3-D shape and the quantity | House hold, school and wider community | Learners should be able to:  
- calculate the volume of any 3-D shape  
- calculate the volume of a prism  
- Determine appropriate quantities of materials/ components needed to complete a task |

**TEACHER ACTIVITIES**

1. **Teaching methods:**
   - Telling, explaining, question and answers, demonstration
2. Prepare a lesson and consider the following:
   2.1 **Introduction**
      - a. **pre-knowledge required for the lesson** calculate area of different shapes, identify different shapes
      - b. **baseline assessment**
         - do correction to the base line assessment
   2.2 **Main Body (Lesson presentation)**
      - Tell learners that in this lesson the focus will be on calculating the volume of solid shape i.e. concrete, chocolate bars cleaning powder, biscuits, margarine etc. [bring some of these containers, or ask learners to bring]. Show learners different containers of packaging shapes. i.e.
      - Remind learners that volume of the **solid** 3-D object, such as a brick or foundation of a house, is the amount of 3-D space occupied by that object.
      - Tell learners that the volume of an object is therefore an indication of how big it is.
      - Tell learners that the unit for volume is mm³, cm³, m³, km³
      - Tell learners that when calculating the volume of solids, you will also have to find how much quantity can be packed and the cost.
      - Demonstrate to learners how to calculate the volume and the quantity that could be packed:
        - A 500g block of butter measures, 7.7 cm in breath, 12.5 cm in length and has a depth of 5.7 cm.
        1. Calculate the volume of the 500g butter
           \[ V = 12.5 \times 7.7 \times 5.7 = 109,725 \text{ cm}^3 \]
        2. Calculate the volume of the packaging box that measures: length = 90cm, breath =30cm, and height = 18 cm

   1. **Base line assessment**
      - Calculate the area of the following shapes
        a. Circle with a diameter of 5cm
        b. Rectangular shape with the length of 10cm and the breadth of 6cm
      - 2. If the area of the rectangular shape is 56m² and the length is 10m. calculate the breadth of the shape
   2. **Activity**
      - 1. Calculate the volume of the marshmallow with the diameter of 2.54 cm and a height of 2.54 cm.
      - A 25g stick of glue has a radius of 14mm and a height of 104 mm.
        - a. Calculate the volume of the glue stick
        - b. If it cost R0.005 to manufacture 1mm³ of glue, calculate the cost to manufacture the 250g glue stick.
      - 3. A rectangular concrete pathway, 12 m long, 1.6 m wide and 0.5 m deep needs to be laid as shown in the diagram below. A bag of ready-mix cement makes 0.25m³ of concrete. The cost per bag of ready-mix cement is R189.95.
         - a. calculate the volume of cement required for the pathway
         - b. how many bags of ready-mix cement will be required for the pathway

   **TIMING**
   - Baseline: 10 min
   - Activity: 45 min
   - Conclusion: 5 min

**RESOURCES NEEDED**
- Newspapers
- Calculators
- Magazines
- chalkboard
3. How many 500g butter can be packed into the box?

Number of 500g in a box = \( \frac{\text{volume of the box}}{\text{volume of the butter}} \)

\( V = 90 \times 30 \times 18 \)
\( = 48600 \text{ cm}^3 \)

\( \frac{48600}{109725} = 442.925 \approx 442 \)

- Do correction to the activity

2.3 Conclusion
Remind learners about the concept learned

c. calculate the total cost of ready-mix cement required for the pathway
<table>
<thead>
<tr>
<th>SECTION</th>
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</tr>
</thead>
</table>
| Calculating perimeter, area and volume | Calculate volume for 3-D shape | House hold, school and wider community | Learners should be able to:  
- calculate the volume of any 3-D shape  
- calculate the volume of a prism  
- Determine appropriate quantities of materials/ components needed to complete a task |

### TEACHER ACTIVITIES

1. **Teaching methods:**  
   - Telling, explaining, question and answers, demonstration
2. **Prepare a lesson and consider the following:**

   2.1 **Introduction**
   - a. pre-knowledge required for the lesson  
     - calculate volume of different shapes, identify different shapes  
   - b. baseline assessment  
     - do correction to the base line assessment

   2.2 **Main Body (Lesson presentation)**
   - Tell learners that the quantity and the capacity of a substance are determined by the size of the container and the shape of the container.
   - Explain to learners that the amount of substance and its cost is determined by the shape of the container i.e. is it cylindrical or rectangular
   - Tell learners that in this lesson we are going to compare different packaging of the same substance and see which one has more capacity and packaging of substances
   - Demonstrate to learners how to calculate the capacity: Look at the pictures below, which has the largest volume

### LEARNER ACTIVITIES

#### Activity

1. **Ronewa makes pencil bags out of fabric. Some pencil bags are cylindrical and other is rectangular.**
   - a. Work out the volume for each pencil bag
   - b. Which bag has the greatest capacity

2. **Zondi is a young who is renting a home for the first time. He is sharing the house with a group of young teachers. To reduce their monthly cost they decide to erect a water tank. They are uncertain of whether to purchase one with vertical tank or the horizontal tank. Mr Zondi says that the horizontal tank holds more water than the vertical tank. His friends disagree.**
   - Vertical tank: Diameter = 86.5 cm, Height = 93.5 cm  
   - Horizontal tank: Diameter = 1.1 m, Length = 2.5 m

3. **Fonos cake shop cells famous fruit cake. They are made in a square tin which has a side 23cm, the cake is 8cm high. The cook decides to bake a round cake using the same recipe. If his tin is 8cm high and measures 21cm across, will it fit into the round tin. Justify your answer.**

### TIMING

- Baseline: 10 min
- Activity: 45 min
- Conclusion: 5 min

### RESOURCES NEEDED

- Newspapers  
- Calculators  
- Magazines  
- Chalkboard
- Do correction to the activity

### 2.3 Conclusion
Remind learners is about calculating the area of different shapes that are combined to create an object

| a. Calculate the volume of each tank in litres |
| b. Who is correct? Give reason for your answer |
| c. In their household they use just between 11kl and 13kl of water a month. Which tank do you think they should purchase. |

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**Reflection/Notes:**

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<table>
<thead>
<tr>
<th>Name of Teacher:</th>
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<td>Date:</td>
<td>Date:</td>
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</tbody>
</table>
LESSON SUMMARY FOR: DATE STARTED:

SECTION CONTENT CONTEXT APPLICATION / LESSON OBJECTIVES
Calculating perimeter, area and volume Work with relationships where Calculate volume and area for 3-D shape House hold, school and wider community

Learners should be able to:
• calculate the volume for a 3-D shape
• calculate the area of a prism
• Determine appropriate quantities of materials/ components needed to complete a task

TEACHER ACTIVITIES
- Let the class sit and issue out write the questions on the chalkboard
- If you have access to a printer, then make copies and hand them out to the learners
- Encourage the learners to write the work under examination conditions
- Move round to monitor learners performance while ensuring that all learners are fully participating
- After the learners complete the task, collect their scripts while they are seated
- You may mark on your own or swap their scripts and let them do peer marking while you display the suggested solutions on the chalkboard.

LEARNER ACTIVITIES
1. Activity:
   1. The following formulae may be used

   area of a circle = \( \pi \times (\text{radius})^2 \)  
   area of rectangle = \( l \times w \)  
   volume of cylinder = \( \pi \times (\text{radius})^2 \times \text{height} \)  
   \( \pi = 3.14 \)

   Maedi lives in the rural area where the supply of water is not always reliable. He therefore bought a tank like the one below to keep water for use:

   ![Diagram of a cylindrical tank with dimensions 120 cm x 180 cm]
- After marking, discuss with learners challenges they may have faced while solving the questions.
- Refer learners to textbooks where they can get the opportunity to practice further on their own.

**2.3 Conclusion**
Remind learners that surface area is about calculating the area of different shapes that are combined to create an object.

- Do correction to the activity

Maedi wants to paint the bottom part of the house with Orange colour and the top part with light green.

1.1 Determine the area of the top circular part (3)
1.2 Calculate the volume of water that the tank can hold if the height of the tank is 180 cm. (3)
1.3 Below is the front view of Maedi’s house.

<table>
<thead>
<tr>
<th>Length of house</th>
<th>15 cm</th>
</tr>
</thead>
<tbody>
<tr>
<td>Height of wall</td>
<td>6 cm</td>
</tr>
<tr>
<td>Window</td>
<td>225mm x 112mm</td>
</tr>
<tr>
<td>Height of door</td>
<td>4.5cm</td>
</tr>
<tr>
<td>Width of door</td>
<td>2cm</td>
</tr>
</tbody>
</table>

Maedi wants to paint the bottom part of the house with Orange colour and the top part with light green.

1.3.1 Work out the area of the bottom part of the door that will not be painted with orange paint. (4)
1.3.2 Convert your answer from 1.3.1 into metres if 100cm = 1m. (3)
1.3.3 Calculate the area of the bottom part of the building. (4)
1.4 Joe works for a company that makes plant pots from cements. He needs to calculate the cost of painting the outside of the pots they produce.

a. Ignore the thickness of the base of each pot, calculate the total surface area of each pot. (5)
b. How much special cement paint is needed to paint 20 pots of each design, if one litre of cement paints covers 5 m²? (6)
c. Calculate the cost of painting 20 pots of each design, if one litre of paint costs R129,95 (3)
### LESSON SUMMARY FOR: DATE STARTED:

<table>
<thead>
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<th>CONTEXT</th>
<th>APPLICATION / LESSON OBJECTIVES</th>
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</thead>
</table>
| Models  | 3-dimensional models of packaging containers | Office space, food packaging | Learners should be able to:  
- Choose the best packaging shape to package particular product  
- Determine the most appropriate way to package on the box for optimal use of space |

### TEACHER ACTIVITIES

1. **Teaching methods:**
   - Question and answer, Discussion, demonstration

2.1 **Introduction**
   a. Pre-knowledge required for the lesson
      - Area, perimeter, volume
      - Knowledge on how to find quantity and the capacity of an item
   b. Baseline assessment:
      - Seen under learner activity

2.2 **Main Body (lesson presentation)**
   - Explain to learners that many goods are packed in boxes because they are easily stacked on shelves to create space.
   - Tell learners that packaging is done in two ways
     1. In terms of 2-Dimension shape
     2. In terms of 3- dimension shape
   - Explain to learners that packaging is done for economical purposes of packing and transporting the goods. The more you pack in one package the less you pay.
   - Tell learners that to pack more for less depends on the shape of the goods. When packing the goods have to occupy most of the package.
   - Tell learners that today you will focus on choosing the best

### LEARNER ACTIVITIES

**Baseline assessment**

1. Calculate the volume of a cylindrical tin of jam with a diameter of 5cm and height of 10.7 cm.
2. Calculate the volume of a smaller tin with a radius of 4cm and the height of 9cm.
3. What is the capacity of each tin in ml.

**Activity**

1. A television set has the following dimension:
   - Length = 125cm, width =65cm, height = 10 cm
   a. What is the best packaging shape that can be used to package the television set?
   b. Twenty round cookies need to be packaged.
   a. What is the best packaging you would use to package the cookies
   b. The diameter of one cookies is 8cm and the height of one cookies is 0.8 cm. what should the length of the container be for 20 cookies

### TIMING

- Baseline: 10 min
- Activity: 45 min
- Conclusion: 5min

### RESOURCES NEEDED

- Newspapers
- Calculators
- Magazines
- chalkboard
A chocolate factory makes chocolate and pack it in a small box. Each chocolate is cube shaped, meaning that length = breath = height. The factory has two options to pack in a triangular based box or rectangular box:

- Rectangular base box
  - 4 cm x 15 cm x 15 cm

- Triangular based box
  - 4 cm x 15 cm x 15 cm

1. Which is the best package to use? Explain and show how you reach your answer.

   First step: estimate how many chocolate can be packed in each side of the shape. In this instance both shape has the same sides.

   No of chocolates per side = \(\frac{15}{4}\) = 3.75

   (0.75 is not full chocolate, and if we round off to 1 then the side will not have enough space for the extra 0.25 that is added to get a one) in this situation we round down to 3

   Step 2: pack the chocolates in each shape and see how many can fit.

   Square shape can fit 9 chocolates less space. The triangular base box can only fit three properly but leave a lot of space.

   This means that the square base box is more efficient.

3. Apple exported need to be packaged.
   a. What is the best packaging shape you would use to package the apples to protect them?
   b. Why would you use that particular shape to package the apples?

4. Four tennis balls need to be packaged.
   a. What is the best packaging shape you can use to package the tennis ball?
   b. Does your packaging shape minimise wasted packaging space?

Home work

1. Fifteen circular chocolates need to be packaged into a cube. The diameter of each chocolate is 25 mm and the height of each chocolate is 20 mm.
   a. If a rectangular box were used, what would the length, width and the height of the box be?
   b. Calculate the surface area of a rectangular tube suitable for the 15 chocolate.
   c. If a cylinder is used what will its radius be and length?
   d. Calculate the surface area of the cylindrical tube suitable for the 15 chocolates.
   e. Which will be the best most cost-efficient packaging – rectangular or the cylindrical tube? Justify your answer.
### best packaging shape

- Look under learner activity for some suggested questions. You may include your own.
- Move round in the classroom while learners are working to monitor their progress and assist where needed.

#### 2.3 Conclusion

- Summarise the lesson and make clarifications where needed
- Give learners home work on the lesson presented

### Reflection/Notes:

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LESSON SUMMARY FOR: DATE STARTED: 08/08/2013
DATE COMPLETED: 08/08/2013

SECTION | CONTENT | CONTEXT | APPLICATION / LESSON OBJECTIVES
--- | --- | --- | ---
Models | 3-dimensional models of packaging containers 2-dimension of scale cut-outs | Office space, food packaging | Learners should be able to:  • Find the amount of material used to make the package  • Determine the most appropriate way to package on the box for optimal use of space

TEACHER ACTIVITIES

1. Teaching methods:
   - Question and answer, Discussion, demonstration

2.1 Introduction
   a. Pre-knowledge required for the lesson
      • Area, perimeter, volume and surface area
      • Knowledge on how to find quantity and the capacity of an item
   b. Baseline assessment:
      Seen under learner activity

2.2 Main Body (lesson presentation)
   • Explain to learners that after determining the best shape to use, the next thing is to determine the amount of material needed to make the package.
   • Tell learners that to pack more for less depends on the shape of the goods. When packing the goods have to occupy most of the package.
   • Tell learners that today you will focus on determining the amount of material used to make a 3-D shape of the package.
   • Explain to learners that knowing the amount of material will help you determine the cost to package a particular object or substance
   • Tell learners that packaging is an important component of

LEARNER ACTIVITIES

Baseline assessment
1. Calculate the volume of a cylindrical tin of jam with a diameter of 5cm and height of 10,7 cm.
2. Calculate the volume of a smaller tin with a radius of 4cm and the height of 9cm.
3. What is the capacity of each tin in ml.

Activity
1. Liquid fruit is manufactured and packed in two types of boxes.
   - Dimension of small box:   dimension of big box:
   - Length = 4,7 cm   length = 9 cm
   - height = 11,9 cm   height = 19,5 cm
   - breadth = 3,8cm   breadth = 5,9
   a. Determine how much material is needed to make the

TIMING
Baseline: 10 min
Activity: 45 min
Conclusion: 5min

RESOURCES NEEDED
Newspapers
Calculators
Magazines
chalkboard
marketing and sales. The amount of material used help in ensuring that the item is well packed.

- Tell learners that we will focus on packages which are boxes of different sizes and shape
- Tell learners that most packages are in a flat box that is to be assembling into a box. To find the amount, area of each side of the shape is calculated
- Demonstrate to learners how to find the amount of material needed for a package:
  A factory for medicinal packaging (boxes and containers for medicine) manufactures two types of plastic containers for tablets and capsules.
  Dimension for the small container: \( d = 5 \text{ cm}; h = 5.5 \text{ cm} \)
  Dimension for the medium container: \( d = 5 \text{ cm}; h = 11 \text{ cm} \)
  a. How much material is needed to manufacture the a small container
  b. How much material is needed to manufacture the a medium container?
  c. Determine the volume of the small and the medium container?
  d. How much bigger is the medium container than that of a smaller

- Look under learner activity for some suggested questions. You may include your own.
- Move round in the classroom while learners are working to monitor their progress and assist where needed.

2.3 Conclusion
- Summarise the lesson and make clarifications where needed
- Give learners home work on the lesson presented

   - a. How much material is needed to manufacture the a small container
   - b. Determine how much material is needed to make the big box.
   - c. How much more material is used for a big box than for a small box
   - d. If each box is filled up to 80% of the volume of the container. How much liquid fruit is in each box
   - e. How much more is the juice in a big box to the small box

2. Pineapple cola, a new South African soft drink company, has hired you to help design their new tin. The height. The height is to be 12cm and the radius is to be a third of the height.

   - a. Find the radius of the tin
   - b. Determine the volume of the tin in litres \( [1 \text{ cm}^3 = 1 \text{ ml}] \)
   - c. How much liquid would be in the tin that is filled to a height of 6cm?
   - d. Determine the surface area of the tin
   - e. Tin cost 1cent per cm\(^2\) and the cola costs 30c per 50ml. what will a tin of cola cost to make

Home work

1. Six tennis ball are packaged for sales. One tennis ball has a diameter of 6.4 cm.
   - a. Write down the radius of one ball
   - b. If the ball were packaged in cylindrical tube, how long would each tube be?
   - c. Calculate the amount of packaging material needed for one cylindrical tube of six balls
   - d. If the balls were packed in a rectangular tube, how
long would each tube be?
e. Calculate the amount of packaging material needed for one rectangular tube of six balls
f. Twelve cylindrical tubes are to be packed into a rectangular box for transport:
   i. If the tubes are packed 3 x 4, what would be the length, width and height of the box be?
   ii. How much cardboard will be needed for the box?
g. If the tubes were packaged 6 x 2, what would be the height, width and length of the box be?
h. How much cardboard will be needed for the box?
i. The cardboard cost R5.77 per m². What would the material for the cheapest box cost?

3. Apple exported need to be packaged.
   a. What is the best packaging shape you would use to package the apples to protect them?
   b. Why would you use that particular shape to package the apples?

4. Four tennis balls need to be packaged
   a. What is the best packaging shape you can use to package the tennis ball?
   b. Does your packaging shape minimise wasted packaging space?

Reflection/Notes:

A **variable** is a quantity which can assume any value in a situation;

**Independent variable** is the variable that starts a situation;

**Dependent variable** is the variable that arises from a situation
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## LESSON SUMMARY FOR: Grade 11 Mathematical Literacy

### DATE STARTED:

### DATE COMPLETED:

<table>
<thead>
<tr>
<th>SECTION</th>
<th>CONTENT</th>
<th>CONTEXT</th>
<th>APPLICATION / LESSON OBJECTIVES</th>
</tr>
</thead>
</table>
| Models  | 3-dimensional models of packaging containers 2-dimension of scale cut-outs | Office space, food packaging | Learners should be able to:  
- Find the best packaging shape to use for fragile and irregular-shaped object  
- Determine the most appropriate way to package on the box for optimal use of space and minimize wasted space and cost |

### TEACHER ACTIVITIES

1. **Teaching methods:**  
   - Question and answer, Discussion, demonstration

2.1 **Introduction**
   - a. Pre-knowledge required for the lesson  
     - Area, perimeter, volume and surface area  
     - Knowledge on how to find quantity and the capacity of an item
   - b. Baseline assessment:  
     - Do corrections to the home work

2.2 **Main Body (lesson presentation)**
   - Explain to learners that sometimes when items are packaged there is some left-over space. This left-over space or wastage can cause items to move around inside the box and perhaps damage it
   - Tell learners that some goods or objects are fragile, when they are packed they have to be packed in a special way that will protect them e.g. television
   - Tell learners that most goods are packed with a protective box with Styrofoam taking up the left over space.
   - Tell learners that it is important to calculate the dimensions of a box needed to package an item, taking into consideration the

### LEARNER ACTIVITIES

<table>
<thead>
<tr>
<th>Activity</th>
<th>TIMING</th>
<th>RESOURCES NEEDED</th>
</tr>
</thead>
</table>
| 1. A desktop computer measuring 37cm x 25cm x 9cm is packaged. There is a layer of Styrofoam protecting the computer.  
   a. If the Styrofoam insert adds another 5cm to the height, 5cm to the length and 5cm to the width of the packaging. Write down the dimensions of the box into which the computer, surrounded by Styrofoam, will fit  
   b. Calculate the surface area of the cardboard needed to make the box | Activity: 45 min | Newspapers  
Calculators  
Magazines  
chalkboard |
| 2. A rectangular box is used to package a television measured 85cm x 22cm x 23cm. Calculate the space occupied by the Styrofoam layer if the volume of the television is 104 821 cm³ | Conclusion: 5min | |
protective material

- Explain to learners that knowing the amount of material will help you determine the cost to package a particular object or substance.
- Tell learners that packaging is an important component of marketing and sales. The amount of material used helps in ensuring that the item is well.
- Demonstrate to learners how to find the amount of material needed to package fragile objects for a package:
  1. A television set has the following dimensions: length = 125 cm; depth = 10 cm; width = 65 cm
     a. The protective layer inserted has added 3 cm to the width, 5 cm to the height, and 4 cm to the length. Write down the dimensions of the box in which the television will be packaged.
     b. How much material is needed to manufacture the box to package the television?
  2. A box used to package 140 apples measures 35 cm x 49 cm x 28 cm. Each apple has a volume of 275 cm$^3$. Calculate the amount of foam needed in the box to keep the fruit from bruising.

- Look under learner activity for some suggested questions. You may include your own.
- Move around in the classroom while learners are working to monitor their progress and assist where needed.

2.3 Conclusion

- Summarise the lesson and make clarifications where needed.
- Give learners homework on the lesson presented.

Reflection/Notes:
### LESSON SUMMARY FOR: DATE STARTED:

<table>
<thead>
<tr>
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<th>CONTENT</th>
<th>CONTEXT</th>
<th>APPLICATION / LESSON OBJECTIVES</th>
</tr>
</thead>
</table>
| Models  | 3-dimensional models of packaging containers 2-dimension of scale cut-outs | Office space, food packaging | Learners should be able to:  
- Find the number of furniture items that can fit into a venue  
- Determine the most appropriate way to arrange the furniture with consideration to the space needed for tables, chairs and walking around |

### LEARNER ACTIVITIES

<table>
<thead>
<tr>
<th>Activity</th>
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</thead>
<tbody>
<tr>
<td>1. Using a scale of 1:50, draw a plan of a classroom with a length of 7m and a width of 6m.</td>
</tr>
<tr>
<td>2. Jabu wants to build a spaza in a driveway of his house. In shop, he will have a counter, two larger fridges, some shelves, as well as three gaming machines.</td>
</tr>
</tbody>
</table>

### TIMING |

- Baseline: 10 min
- Activity: 45 min
- Conclusion: 5 min

### RESOURCES NEEDED |

- Newspapers
- Calculators
- Magazines
- Chalkboard
Tell learners that the other way that could help arrange the furniture without moving is to use a scale to scale down all the measurements proportionally.

Demonstrate to learners how to arrange and fit a furniture in a room.

John decide to convert his garage into a tuck shop. He needs to work out where he can place the counter with till, some shelving and a freezer. His garage is 6m long and is 3,2 m wide with a 2m garage door midway in the smaller of the two wall as shown on the plan:

Using a scale of 1:25
a. Calculate the length side and the width sides of the shops on your plan
b. Calculate the width of a door on your plan if the actual door is 1.8 m wide
c. Calculate the dimensions of one gaming machine on your plan
d. Calculate the dimension of one fridge on your plan
e. Calculate the width of the shelving on your plan
f. Calculate the dimensions of the counter on your plan
g. Draw the plan of the shop using the scale 1:25
h. Draw the counter on your plan, in a suitable position. Remember to leave space for a customer as well as Jabu or his assistance
i. Draw shelving on the right-hand side of the shop
j. Draw two fridges at the back of the shop on your plan
k. Draw three gaming machines on the left-hand side of the shop
l. How much space is there for shelving?

1. If the scale of the plan is 1:50
   a. What is the length of the garage on the plan?
   b. What is the width of the garage on the plan?
   c. How wide is the garage door on the plan?
2. John wants the counter to be 1.5 m away from the front of the shop. The length of the counter is 2 m and the width is 800 mm
   a. How far back on the plan must the counter be from the door of the shop
   b. How long is the counter on the plan

Look under learner activity for some suggested questions. You may include your own.

Move round in the classroom while learners are working to monitor their progress and assist where needed.

2.3 Conclusion
- Summarise the lesson and make clarifications where needed
- Give learners home work on the lesson presented
### Lesson Summary

**Grade:** 11  
**Subject:** Mathematical Literacy  
**Week:** 5  
**Term:** 3  
**Topic:** Maps, plans and other representations of the physical world (model and plans)  
**Time:** 60 min

**Lesson 1**

**Lesson Summary for:**  
**Date Started:**  
**Date Completed:**

<table>
<thead>
<tr>
<th>Section</th>
<th>Content</th>
<th>Context</th>
<th>Application / Lesson Objectives</th>
</tr>
</thead>
</table>
| Plans (floor, elevation and design plans) | Floor plan’s notations and symbols | personal and household finance Measurement | Learners should be able to:  
• Understand symbols and notations used on plans |

### Teacher Activities

1. **Teaching methods:**  
   Question and answer, Discussion, demonstration

2.1 **Introduction**  
   a. Pre-knowledge required for the lesson  
      • Knowledge of scale  
      • Knowledge of area  
   b. Baseline assessment:  
      Seen under learner activity

2.2 **Main Body (Lesson presentation)**

   - Tell learners that plans, instructional diagram and pamphlet to assemble objects are part of our daily life.  
   - Tell learners that it makes life easy if you can be able to read and understand instructions and plans  
   - Tell learners that floor plans are 2-D drawings showing what the inside of the building looks like without the roof  
   - Explain to learners that a floor plan shows the design and dimensions of the inside building; the shape and position of rooms, windows, doors, wall and other fittings such as toilets, cupboard.  
   - Tell learners that a floor plan shows the length and the width, but not the height of the windows, doors, walls and rooms

### Learner Activities

**Baseline assessment**

1. In your own words, explain the following terms:
   1.1 area  
   1.2 scale

**Activity**

1. Answer the following questions using the floor plan below:
   a. How many rooms are there in the design?  
   b. How many bedrooms are there in the plan?  
   c. How is bathroom 1 different from bathroom 2?  
   d. How many windows are there in the plan?  
   e. How many doors are there on the plan?  
   f. Explain how you would walk to bathroom 1 to bathroom 2  
   g. Give the dimension of bedroom 1

### Timing

- **Baseline:** 10 min  
- **Activity:** 45 min  
- **Conclusion:** 5 min

### Resources Needed

- Newspapers  
- Calculators  
- Magazines  
- Chalkboard
inside the building
• Tell learners that floor plans have symbols that are used to indicate parts of the house i.e. windows, doors, etc.
• Provide learners with the symbols and discuss them

<table>
<thead>
<tr>
<th>Single window panel</th>
<th>doors</th>
<th>bath</th>
<th>Toilet</th>
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<table>
<thead>
<tr>
<th>Kitchen sink</th>
<th>Free stand sink /basin</th>
<th>Wall</th>
<th>Partial wall</th>
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• Look under learner activity for some suggested questions. You may include your own.
• Move round in the classroom while learners are working to monitor their progress and assist where needed.

[at the end of this lesson plan, there are other notations and their symbol] you can find others for learners

2.3 Conclusion
• Summarise the lesson and make clarifications where needed
• Give learners home work on the lesson presented

2. 
Look at this floor plan and answer the questions
<table>
<thead>
<tr>
<th>Question</th>
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<tbody>
<tr>
<td>a. How many windows are there in the design?</td>
<td></td>
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<tr>
<td>b. Are all windows the same length?</td>
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<tr>
<td>c. How many couch are there in the design?</td>
<td></td>
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<tr>
<td>d. What types of doors are there in the design?</td>
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<tr>
<td>e. What room is represented in the design?</td>
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<td>f. How wide is the room on the design?</td>
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<td>g. How long is this room?</td>
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**Reflection/ Notes:**

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</table>
**GRADE** | **11**  
**SUBJECT** | **Mathematical Literacy**  
**WEEK** | **5**  
**TERM** | **3**  
**TOPIC** | **Maps, plans and other representations of the physical world (model and plans)**  
**Time:** | **60min**  
**Lesson** | **2**

**LESSON SUMMARY FOR:**  
**DATE STARTED:**  
**DATE COMPLETED:**  

### SECTION | CONTENT | CONTEXT | APPLICATION / LESSON OBJECTIVES
--- | --- | --- | ---
Plans (floor, elevation and design plans) | Calculating the actual length of an object in a plan  
Scale calculations | personal and household finance Measurement | Learners should be able to:  
• Determine the actual length of an object shown on the plan using measurement and a given scale

### TEACHER ACTIVITIES

1. **Teaching methods:**  
   Question and answer, Discussion, demonstration

2.1 **Introduction**  
a. Pre-knowledge required for the lesson  
   • Knowledge of scale  
   • Knowledge of area

b. Baseline assessment:  
   Seen under learner activity

2.2 **Main Body (lesson presentation)**  
• Tell learners that plans, instructional diagram and pamphlet to assemble objects are part of our daily life.  
• Tell learners that it makes life easy if you can be able to read and understand instructions and plans  
• Tell learners that to understand the floor plans, you need your knowledge of scale, area, perimeter and volume  
• Remind learners that a floor plan shows the design and dimensions of the inside building; the shape and position of rooms, windows, doors, wall and other fittings such as toilets, cupboard.

• Tell learners that in a plan the actual dimension (area) of the rooms are not indicated, sometimes you will need to calculate

### LEARNER ACTIVITIES

**Baseline assessment**

1. In your own words, explain the following terms:
   1.1 area
   1.2 scale

**Activity**

1. Answer the following questions using the floor plan below
   a. How many rooms are there in the design?
   b. Give the dimension of bedroom 1
   c. Bedroom 1 and 2 are the same size. Calculate the length of the separating wall if the measurement on the plan is 2.5 cm and the scale is 1:150
   d. Calculate the area of the floor plan for bedroom 2
   e. Calculate the cost to carpet bedroom 1 and 2. If carpeting cost R110,00 per m²
   f. How many doors are there on the plan?

**TIMING**  
Baseline: 10 min  
Activity: 45 min  
Conclusion: 5min

**RESOURCES NEEDED**  
Newspapers  
Calculators  
Magazines  
chalkboard
them so that it can help you when you want to renovate the house i.e. paint, tile etc.

- Tell learners that a floor plan shows the length and the width, but not the height of the windows, doors, walls and rooms inside the building
- Demonstrate to learners how to calculate the dimensions

a. How many rooms are there in a plan
   6 room and two toilets
b. Calculate the dimension of bedroom 2
   6x5
c. Calculate the floor area of laundry
   \[ A = 4 \times 2 = 8 \text{m}^2 \]
d. If it costs R58 per m² of floor to tile. Calculate the cost to tile the bathroom
   \[ \text{Cost} = 8 \times 58 = R464,00 \]
e. The length of bedroom 1 is 4m, the height is 2.6m.
   calculate the surface area of the wall

\[ \text{Area} = 4 \times 2.6 = 10.4 \text{m}^2 \]
Bedroom 1 is a square shape
SA = 4 (2.6 x 4) = 41.6 m²

f. Paint covers a wall at 5m² per litre. Calculate the amount of paint needed to paint this wall if the area of the window is 0.4m² and the area of the door is 1.2 m².

SA (painted) = 41.6 - 0.4 - 1.2
= 40 m²

Number of litres = 40 ÷ 5
= 8 L

- Look under learner activity for some suggested questions. You may include your own.
- Move round in the classroom while learners are working to monitor their progress and assist where needed.

2.3 Conclusion
- Summarise the lesson and make clarifications where needed
- Give learners home work on the lesson presented

Reflection/Notes:

Name of Teacher:  
HOD:
Sign:  
Sign:  
Date:  
Date:
LESSON SUMMARY FOR: DATE STARTED: | DATE COMPLETED:
---|---
SECTION | CONTENT | CONTEXT | APPLICATION / LESSON OBJECTIVES
Plans (floor, elevation and design plans) | Calculating the actual length of an object in a plan | personal and household finance | Learners should be able to:
Scale calculations | Measurement | • Analyse the layout of the structure shown and suggest alternative layout options and alterations

TEACHER ACTIVITIES

1. Teaching methods:
   Question and answer, Discussion, demonstration

2.1 Introduction
   a. Pre-knowledge required for the lesson
      • Knowledge of scale
      • Knowledge of area
   b. Baseline assessment:
      Seen under learner activity

2.2 Main Body (lesson presentation)
   • Tell learners that houses can be expanded and to expand the house the floor plan has to be changed to reflect the new pattern of the house.
   • The changing of the house floor plan is called alteration
   • Tell learners that when doing alterations, you need to calculate the amount of material that you will need, so that when you draw the plan the scale part of the new area is reflected accurately.
   • Tell learners that they will need to calculate perimeter, area, quantity and cost, when altering a portion of the house i.e. Changing a wall shower to a glass shower and tiling the shower

LEARNER ACTIVITIES

Activity
   a. Justine bought an apartment flat. The flat had recently been painted, now he wants to make a few changes. Study the information below and answer the questions that follows:
      • The height of the wall is 3 m
      • The door to entrance hall is 150cm wide and 210cm high.
      • There is a semi-circular window above the door
      • The windows in the Northern wall are all 1,2 m high and 40cm wide
      • The door to the kitchen is on the western side. The measurements are 90cm x 210 cm
      • Length of the room is 4,2 m and the breadth of the room is 3,6 m
   Justine wants to attach a wooden strip to all four walls, 1m from the floor
   Wants to paint the top part of the wall a lighter shade than the present colour.
   He wants to replace the semi-circular glass with stained glass insert.
      a. Calculate the minimum length of the wooden strip he will need to buy in metres
      b. Calculate the area of the semi-circular window above the door to the entrance
      c. The artist who will make the stained glass insert for the

TIMING
Baseline: 10 min
Activity: 45 min
Conclusion: 5min

RESOURCES NEEDED
Newspapers
Calculators
Magazines
chalkboard
• Discuss with learners the information below on things need to be done when doing the alteration of the shower, get learners input
   Put a decoration strip on two sides of the wall, calculate the length that will be occupied by the decoration strip in the wall and lastly calculate quantity and the cost strips
   Measure the new base for a shower i.e. 900mmx900mm
   Calculate how much bricks you will need and how much
   Concrete you will need.
   Then calculate the quantity of mosaic tiles that you will use to cover the floor base for the shower.

• Look under learner activity for some suggested questions. You may include your own.
• Move round in the classroom while learners are working to monitor their progress and assist where needed.

[At the end of this lesson plan, there are other notations and their symbol] you can find others for learners

2.3 Conclusion
• Summarise the lesson and make clarifications where needed
• Give learners home work on the lesson presented

semi-circular window charges 30c per square metre. Calculate how much Justine will have to pay for the stained glass window.
d. Calculate the total area of the wall to be painted in square metres.

e. If 5L of paint covers 12m², how many 5L of paint must Justine buy?

Name of Teacher: ___________________________  HOD: ___________________________

Sign: ______________________________________  Sign: ___________________________

Date: ___________________________  Date: ___________________________
# Lesson Summary

**Date Started:**

**Date Completed:**

**Lesson Objectives:**

- Learners should be able to:
  - Draw rough and scale drawing/design or items to be manufactured
  - To show the front, side, and back view
  - Determine the actual length using measurement and the given scale

## Teacher Activities

1. **Teaching Methods:**
   - Question and answer, Discussion, demonstration

2.1 **Introduction**

   a. Pre-knowledge required for the lesson
   - Knowledge of scale
   - Knowledge of area

   b. Baseline assessment:
   - Seen under learner activity

2.2 **Main Body (lesson presentation)**

   - Tell learners that a house or product or an item have different sides that can be viewed to describe the object.
   - Tell learners when designing a plan i.e. house plan or product plan you need to reflect the different sides of the plan and draw them in 2-dimensional. Show the sides of the object or the house plan.
   - Explain to learners that these sides are describe in relation on how you view the object i.e. Front view, Top view, Back view, Side view

## Learner Activities

### Activity

1. What is the actual measurement on the plan in cm of the following measurement (scale 1:100)
   - 1mm
   - 2mm
   - 5mm
   - 10mm

2. Look at the 3-dimensional picture of a garage at your home. Use the picture to answer the questions below

## Resources

- Newspapers
- Calculators
- Magazines
- Chalkboard

## Timing

- Baseline: 10 min
- Activity: 45 min
- Conclusion: 5 min
Tell learners that once they have identified the views, they need to draw a rough drawing of the different perspectives.

Explain to learners that a scale is used to draw an accurate drawing or plan of the object.

Tell learners that a two dimension plan can be drawn accurately using a scale.

Remind learners about the types of scales:
1. Ratio scale
2. Bar scale

Explain to learners that to draw the views accurately we use the scale and make the correct calculation.

Demonstrate to learners how to calculate using a scale.

Example:
A container is 600mm long, 300mm wide, and 400mm high.

Start by finding the appropriate scale:

Convert mm to cm, in this instance 600mm (is too large to draw) Divide by 10 each measurement:

Scale 1:20

Start by finding the appropriate scale:

a. Draw a rough picture of the side view, front view, back view of the house.
b. Draw the scale drawing of the front view if the length is 4 m, height is 3 m and the breadth is 3.5 m. (1:50)
3. The side view of a house is given below.

Example:
A container is 600mm long, 300mm wide, and 400mm high.

a. Calculate the dimension of this plan by completing the table below scale 1:100

<table>
<thead>
<tr>
<th>Feature</th>
<th>Measure on the Plan (cm)</th>
<th>Actual Real-World Measure</th>
</tr>
</thead>
<tbody>
<tr>
<td>Wall Length</td>
<td>6 m</td>
<td></td>
</tr>
<tr>
<td>Wall Width</td>
<td>3 m</td>
<td></td>
</tr>
<tr>
<td>Wall Height</td>
<td>2.5 m</td>
<td></td>
</tr>
<tr>
<td>Roof Height</td>
<td>1.2 m</td>
<td></td>
</tr>
<tr>
<td>Door Height</td>
<td>1.8 m</td>
<td></td>
</tr>
<tr>
<td>Windows height</td>
<td>0.3 m</td>
<td></td>
</tr>
</tbody>
</table>

Grade 11 Mathematics Literacy Lesson Plans

Term 3 Page 60

© Gauteng Department of Education (CAPS version)
\[
\begin{align*}
600/10 &= 60\text{ cm} : \ 300/10 = 30\text{ cm} : \ 400/10 = 40\text{ cm} \\
60\text{ cm} : 30\text{ cm} : 40\text{ cm} & \text{ (too big to draw on a paper)} \\
\text{Divide by the scale factor which is (20) to reduce the size to fit:} \\
60\text{ cm}/20 &= 3\text{ cm} ; \ 30\text{ cm}/20 = 1.5\text{ cm} ; \ 40\text{ cm}/20 = 2\text{ cm}
\end{align*}
\]

Now the appropriate scale has been found:

- **Length** = 3 cm
- **Height** = 2 cm
- **Width** = 1.5 cm

Now you can make the scale drawing of the container or the views of the container.

- Look under learner activity for some suggested questions. You may include your own.
- Move round in the classroom while learners are working to monitor their progress and assist where needed.

2.3 **Conclusion**

- Summarise the lesson and make clarifications where needed
- Give learners home work on the lesson presented

**Reflection/Notes:**
<table>
<thead>
<tr>
<th>Name of Teacher:</th>
<th>HOD:</th>
</tr>
</thead>
<tbody>
<tr>
<td>Sign:</td>
<td>Sign:</td>
</tr>
<tr>
<td>Date:</td>
<td>Date:</td>
</tr>
</tbody>
</table>
**Lesson Summary**

**Date Started:**

**Date Completed:**

<table>
<thead>
<tr>
<th>Section</th>
<th>Content</th>
<th>Context</th>
<th>Application / Lesson Objectives</th>
</tr>
</thead>
</table>
| Plans (floor, elevation and design plans) | Calculating the actual length of an object in a plan | personal and household finance Measurement | Learners should be able to:  
  - Identify and describe the features of the plan  
  - Draw rough and scale drawing/drawings/designs or items to be manufactured  
  - To show the front, side and back view  
  - Determine the actual length using measurement and the given scale |

**Teacher Activities**

1. **Teaching methods:** Question and answer, Discussion
   - Let the class sit and issue out or write the questions on the chalkboard
   - If you have access to a printer, then make copies and hand them out to the learners
   - Encourage the learners to write the work under examination conditions
   - Move round to monitor learners’ performance while ensuring that all learners are fully participating
   - After the learners complete the task, collect their scripts while they are seated
   - You may mark on your own or swap their scripts and let them do peer marking while you display the suggested solutions on the chalkboard.
   - After marking, discuss with learners challenges they may have faced while solving the questions.
   - Refer learners to textbooks where they can get the opportunity to practice further on their own.

**Learner Activities**

**Activity**

1. Look at the plan below and answer the questions that follow.

**Timing**

**Resources Needed**

- Newspapers
- Calculators
- Magazines
- Chalkboard

**Correction**

Activity: 45 min  
Correction: 15 min
2.2 Conclusion
- Summarise the lesson and make clarifications where needed
- Give learners home work on the lesson presented

<table>
<thead>
<tr>
<th>Conclusion</th>
</tr>
</thead>
<tbody>
<tr>
<td>a. How many bedrooms are in the plan? (1)</td>
</tr>
<tr>
<td>b. How many baths are shown in the plan? (1)</td>
</tr>
<tr>
<td>c. What does the symbol mean? (1)</td>
</tr>
<tr>
<td>d. How many doors need to be bought for this house? (2)</td>
</tr>
<tr>
<td>e. Calculate the carpeting that needs to order for a living room with the dimensions of 4 m x 5.5 m (5)</td>
</tr>
</tbody>
</table>

2. Mr Katlego has built a spaza shop. He wants to fit shelving along two sides of the shop. Each of the sides is 2.5 m long. Each shelf is 1 m long. Shelves should be 1 m apart with the lowest shelf 0.2 m above the ground and the highest shelf being 1 m from the roof. The height of the shop is 3.2 m.

| a. Calculate the length of shelving needed (5) |
| b. Using a scale of 1:100, draw a plan of the inside of the spaza shop (8) |
| c. Using the same scale sketch shelving on your plan (4) |
| d. The cost of cupboard shelving per metre is R26.50. Calculate the total cost of shelving (4) |
### Lesson Summary for: Date Started: 

<table>
<thead>
<tr>
<th>SECTION</th>
<th>CONTENT</th>
<th>CONTEXT</th>
<th>APPLICATION / LESSON OBJECTIVES</th>
</tr>
</thead>
</table>
| Plans (floor, elevation and design plans) | Calculating the actual length of an object in a plan | personal and household finance Measurement | Learners should be able to:  
- Understand elevation  
- Making sense of the elevation features |

### Teacher Activities

1. **Teaching methods**
   - Question and answer, Discussion, demonstration

2.1 **Introduction**
   - Pre-knowledge required for the lesson
     - Knowledge of scale
     - Knowledge of area
   - Baseline assessment:
     - Seen under learner activity

2.2 **Main Body (lesson presentation)**
   - Tell learners that elevation plans, are 2-dimensional drawing showing the design and dimension of the outside of a building as seen from the side
   - Tell learners that elevations plans will show the following information:
     1. The dimensions of the length and the height of the outside walls
     2. The position of windows and doors in the wall
     3. The dimension and the design of the roof
   - Explain to learners that elevation plans are drawn to show the design and dimensions of every unique outside wall of the building. If the building has two walls that are the same, then only one elevation plan will be drawn to represent both of them
   - Tell learners that each elevation plan contains one of the following heading:

### Learner Activities

#### Baseline assessment

1. In your own words, explain the following terms:

   1.1 **area**
   1.2 **scale**

#### Activity

1. In the elevation plan below, identify the North, South, West and East elevation

### Timing

| Baseline: 10 min | Newspapers |
| Activity: 45 min | Calculators |
| Conclusion: 5min | Magazines |
|                | chalkboard |
North elevation
South elevation
East elevation
West elevation

Tell learners that you need a compass to be able to know which side of the house represent the elevations.

The North elevation is the side that is facing you, in front of you when you are facing the compass direction north. In such that the side that is shown on the North elevation is facing South

South elevation is the side that is facing North

East elevation is the side that is facing West

West elevation is the side that is facing East

For example if the lounge of the house is positioned on the West elevation of the plan, this means the lounge is facing East

Tell learners that in a plan there will be an arrow that indicate the direction of North in the plan

Demonstrate to learners how to identify the elevation
A = NORTH ELEVATION - it is facing South

C = East elevation - it is facing West

- Look under learner activity for some suggested questions. You may include your own.
- Move round in the classroom while learners are working to monitor their progress and assist where needed.
  [at the end of this lesson plan, there are other notations and their symbol] you can find others for learners

2.3 Conclusion
- Summarise the lesson and make clarifications where needed
- Give learners home work on the lesson presented

2. In the picture above indicate the other elevation if the elevation side with the door is the North elevation
## Reflection/Notes

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<tr>
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<td>Date:</td>
</tr>
</tbody>
</table>
### Lesson Summary

| Section: Plans (floor, elevation and design plans) | Content: Calculating the actual length of an object in a plan | Context: Personal and household finance, Measurement | Application / Lesson Objectives: Learners should be able to:
- Understand elevation
- Making sense of the elevation features |

### Teacher Activities

1. **Teaching methods:** Question and answer, Discussion, demonstration

2.1 **Introduction**

   a. Pre-knowledge required for the lesson
   - Knowledge of scale
   - Knowledge of area

   b. Baseline assessment: Seen under learner activity

2.2 **Main Body (lesson presentation)**

   - Tell learners that elevation plans are 2-dimensional drawing showing the design and dimension of the outside of a building as seen from the side
   - Tell learners that each elevation plan is labelled according to the side and direction they face, i.e. front view, right side view, left side view, back view or North elevation, South elevation, East elevation, West elevation

   - Tell learners that when looking at the elevations, you need to be able to identify their features. This will be helpful when you looking at the house and be able to tell that each elevation is representing which side by looking at the features, i.e.

### Learner Activities

**Activity**

1. In the elation plan below, identify the features of the North, South, West and East elevation

   ![Elevation Plan](image1)

2. Look at the picture below and describe the features of this front view:

   ![Front View](image2)

### Timing

- **Baseline:** 10 min
- **Activity:** 45 min
- **Conclusion:** 5 min

### Resources Needed

- Newspapers
- Calculators
- Magazines
- Chalkboard
3. Identify the features of elevation 1 and 2

A = NORTH ELEVATION - it is facing South

Features it has one door

C = East elevation - it is facing West

Features it has one double window
- Look under learner activity for some suggested questions. You may include your own.
- Move round in the classroom while learners are working to monitor their progress and assist where needed.

2.3 Conclusion
- Summarise the lesson and make clarifications where needed
- Give learners home work on the lesson presented

Reflection/Notes:

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<td>Date:</td>
</tr>
</tbody>
</table>
**LESSON SUMMARY FOR: DATE STARTED:**

<table>
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<tr>
<th>SECTION</th>
<th>CONTENT</th>
<th>CONTEXT</th>
<th>APPLICATION / LESSON OBJECTIVES</th>
</tr>
</thead>
</table>
| Plans (floor, elevation and design plans) | Calculating the actual length of an object in a plan | personal and household finance Measurement | Learners should be able to:  
- Understand elevation  
- Identify the and connect the features shown on the elevation plan with the perspective shown on the floor plan on the same structure |

**TEACHER ACTIVITIES**

1. **Teaching methods:** Question and answer, Discussion, demonstration

2.1 **Introduction**

a. Pre-knowledge required for the lesson
   - Knowledge of scale
   - Knowledge of area

b. Baseline assessment:
   Seen under learner activity

2.2 **Main Body (lesson presentation)**

- Tell learners that elevation plans, are 2-dimensional drawing showing the design and dimension of the outside of a building as seen from the side
- Tell learners that when building a house your plan comes in three features,
  1. Picture of the complete building
  2. The elevations
  3. Floor plan

Explain to learners that all these features are related to each other they help understand the house plan. The elevations alone will not help us to know how the interior of the plan look like since it focuses on the outside i.e. see windows, not sure whether they are for a bedroom or a dining room. The floor plan helps in providing the details of the features of the elevation, it’s like you have removed

**LEARNER ACTIVITIES**

1. Look at the plan below and answer the questions that follows:

   ![Plan View](image)

   a. Which picture shows the plan?
   b. What is shown by picture A and C?

2. Answer the following questions based on the floor plan and the elevation plan

   ![Plans and Elevations](image)

   a. Decide which of the views below is either a plan, front elevation or side elevation of the object shown.

**TIMING**

Baseline: 10 min

Activity: 45 min

Conclusion: 5 min

**RESOURCES NEEDED**

- Newspapers
- Calculators
- Magazines
- chalkboard
the roof and looking from the inside
e.g.

1. Front view
2. Side elevation view (right)
3. Floor plan
4. Side elevation (left)

- Discuss with the learners the picture above
- Tell learners that in the previous lessons we looked at the features of the floor plan and the elevation, in this lesson we are going to combine the two to give a good and proper description of the plan
- Discuss the picture below
Look under learner activity for some suggested questions. You may include your own.
Move round in the classroom while learners are working to monitor their progress and assist where needed.
[at the end of this lesson plan, there are other notations and their symbol] you can find others for learners

2.3 Conclusion
Summarise the lesson and make clarifications where needed
Give learners home work on the lesson presented

a. If the reception is the front view, North elevation. Label the elevation plan
b. Match the elevation house to the floor plan, give reason for your choice
c. Using the floor plan name the features of the East elevation and South elevation

3. use the floor plan below to answer the following questions

a. Draw the North elevation of the plan, not to scale
b. Name the features of the East elevation
b. Would the West elevation have a door?
d. Why there is no roof details in this plan?
<table>
<thead>
<tr>
<th>Name of Teacher:</th>
<th>HOD:</th>
</tr>
</thead>
<tbody>
<tr>
<td>Sign:</td>
<td>Sign:</td>
</tr>
<tr>
<td>Date:</td>
<td>Date:</td>
</tr>
</tbody>
</table>
### LESSON SUMMARY FOR: DATE STARTED:  
**DATE COMPLETED:**

<table>
<thead>
<tr>
<th>SECTION</th>
<th>CONTENT</th>
<th>CONTEXT</th>
<th>APPLICATION / LESSON OBJECTIVES</th>
</tr>
</thead>
</table>
| Plans (floor, elevation and design plans) | Calculating the actual length of an object in a plan Scale calculations | personal and household finance Measurement | Learners should be able to:  
- Understand elevation  
- Determine the actual length using measurement and the given scale |

### TEACHER ACTIVITIES

1 **Teaching methods**
   - Question and answer, Discussion, demonstration

2.1 **Introduction**
   - Pre-knowledge required for the lesson
     - Knowledge of scale
     - Knowledge of area
   - Baseline assessment: Seen under learner activity

2.2 **Main Body (lesson presentation)**
   - Tell learners that elevation plans, are 2-dimensional drawing showing the design and dimension of the outside of a building as seen from the side
   - Tell learners that a two dimension plan can be drawn accurately using a scale.
   - Remind learners about the types of scales:  
     1. Ratio scale  
     2. Bar scale
   - Explain to learners that to draw the

### LEARNER ACTIVITIES

**Activity**

1. Below is a floor plan of a small office building. Using the measurements make a scale drawing of the East elevation of the building if the following dimension is added. Use the scale 1:100  
   - Dimension of doors : 90cm by 2m  
   - Dimensions of windows 100cm by 150cm  
   - Height of walls 3m  
   - Height of windows from the floor 75cm

2. Make a scale drawing of the West elevation of the plan below.
elevation accurately we use the scale and make the correct calculation

• Demonstrate to learners how to calculate using a scale
  Example:
  A container is 600mm long, 300mm wide, and 400mm high.

3. An architect is drawing a plan of a building in the scale 1 : 20. The table below shows the actual real-world measurements of some of the dimensions of the building. You need to use the scale to determine how long the architect will need to draw these dimensions on the plan. (TL3)

<table>
<thead>
<tr>
<th>Feature</th>
<th>Measure on the Plan (cm)</th>
<th>Actual Real-World Measure</th>
</tr>
</thead>
<tbody>
<tr>
<td>Wall Length</td>
<td>8 m</td>
<td></td>
</tr>
<tr>
<td>Wall Width</td>
<td>4,5 m</td>
<td></td>
</tr>
<tr>
<td>Wall Height</td>
<td>2,2 m</td>
<td></td>
</tr>
<tr>
<td>Roof Height</td>
<td>1,2 m</td>
<td></td>
</tr>
<tr>
<td>Door Height</td>
<td>1,8 m</td>
<td></td>
</tr>
</tbody>
</table>
Now the appropriate scale has been found:
Length = 3cm
Height = 2cm
Width = 1.5cm

Now you can make the scale drawing of the container or the views of the container.

- Look under learner activity for some suggested questions. You may include your own.
- Move round in the classroom while learners are working to monitor their progress and assist where needed.

[At the end of this lesson plan, there are other notations and their symbol] you can find others for learners

2.3 Conclusion
- Summarise the lesson and make clarifications where needed
- Give learners home work on the lesson presented
Lesson 5

Maps, plans and other representations of the physical world (model and plans)

Time: 60min

LESSON SUMMARY FOR: DATE STARTED:
DATE COMPLETED:

SECTION | CONTENT | CONTEXT | APPLICATION / LESSON OBJECTIVES |
--- | --- | --- | --- |
Plans (floor, elevation and design plans) | Calculating the actual length of an object in a plan | personal and household finance | Learners should be able to:
Scale calculations | Measurement |

**TEACHER ACTIVITIES**

1. **Teaching methods**
   - Question and answer, Discussion,

2.1 **Introduction**
   a. Pre-knowledge required for the lesson
   - Knowledge of scale
   - Knowledge of area
   b. Baseline assessment:
   - Seen under learner activity

2.2 **Main Body (lesson presentation)**

   - Remind learners about the four basic sides of elevation
     - North elevation
     - South elevation
     - East elevation
     - West elevation
   - Remind learners that you need a compass to be able to know which side of the house represent the elevations.
   - The **North elevation** is the side that is facing you, in front of you when you are facing the compass direction north. In such that the side that is shown on the North elevation is

   **LEARNER ACTIVITIES**

   **Activity**

   1. Describe the following terms (4)
      a. Elevation
      b. North elevation
      c. South elevation
      d. West elevation
   2. Use the plan below to answer the following questions

   **Activity:**

   S

   a. Identify the North, South, East, West elevation (8)
facing South
- South elevation is the side that is facing North
- East elevation is the side that is facing West
- West elevation is the side that is facing East

- Look under learner activity, give them the test activity.
- Move round in the classroom while learners are working to monitor their progress and assist where needed.
- Do corrections with the learners, where the mark each other’s work

2.3 Conclusion
- Summarise the lesson and make clarifications where needed

3. Use this plan to answer the questions below:
   a. How many rooms does this plan have? (4)
   b. What are the features of the West elevation? (2)
   c. Make a rough sketch of the West elevation (2)
   d. Using a scale of 1:100 draw the scale drawing of West elevation
      If the dimension of the windows is 45cm by 35cm
      Height of the wall is 4m
      Length of the wall is 10m (10)
### LESSON SUMMARY FOR: DATE STARTED:

<table>
<thead>
<tr>
<th>SECTION</th>
<th>CONTENT</th>
<th>CONTEXT</th>
<th>APPLICATION / LESSON OBJECTIVES</th>
</tr>
</thead>
</table>
| Taxation (VAT and UIF) | Vat, types of VAT, VAT-inclusive | Business, salaries, personal income, payslips | Learners should be able to:  
- Understand VAT  
- Understand VAT inclusive value and value excluding VAT  
- Differentiate between VAT inclusive value and value excluding VAT  
- Calculate VAT-inclusive price |

### TEACHER ACTIVITIES

1. **Teaching methods:**  
   - Question and answer, Discussion, demonstration, telling and explaining

2. **Introduction**  
   a. Pre-knowledge required for the lesson  
      - Knowledge of percentage  
      - Knowledge of VAT

   b. Baseline assessment:  
      Seen under learner activity

2.2 **Main Body (lesson presentation)**

- Explain to learners that VAT is one form of tax that South African Government collects from people to enable the government to provide services to the population.
- Remind learners that VAT stands for **Value added tax**
- Tell learners that VAT is charged on most goods that we buy (food, furniture, toys, plants etc.). It is also charged on most services rendered (cell phone rental and usage, municipality accounts, haircuts, attorney fees etc.)
- Remind learners that some items are VAT exempted or **zero-rated**. These include basic food items, which are identified in the till slip by a (*) or a (#). Some stores use code to identify taxable items and items exempted from tax

### LEARNER ACTIVITIES

#### Baseline assessment

1. calculate

1.1 14% of R650

1.2 give two examples of items in which VAT is not calculated

1.3 in a till slip how would you know if VAT is not calculated

#### Activity

1. Joseph is an owner of a clothing shop. He buys clothing items on a wholesaler where it is clearly indicated that the displayed prices are VAT-exclusive. Calculate the VAT-inclusive price of a shirt when the VAT-exclusive price is R120.50

2. Complete the following Table. Calculate the VAT amount and the VAT-inclusive price for the clothing items that Joseph bought at the wholesaler

<table>
<thead>
<tr>
<th>Items</th>
<th>VAT-exclusive price</th>
<th>VAT amount</th>
<th>VAT-inclusive price</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
• Tell learners that certain charges like property rates are already a form of tax, hence no VAT is payable.
• Remind learners that VAT is calculated as a percentage of the purchase price.
• VAT percentage is 14.
• Tell learners that the cost of goods or services are given in two ways:
  1. VAT exclusive price, 14% to be added.
  2. VAT inclusive prices, 14% already added.
• Tell learners that in this lesson will focus on **VAT inclusive** price.
• Tell learners that the most price that they see on products in a shop are VAT inclusive.
• Explain to learners that when they have VAT inclusive price, they will know the exact amount to be paid at the till.
• Tell learners that if VAT is included, the given value is 114% of the original value.
The VAT exclusive price = 100% of cost price
The VAT percentage = 14% of the cost price
The VAT inclusive price = 114% of the cost price.
• Tell learners the most appropriate manner to calculate this will be to calculate the VAT inclusive price of the VAT exclusive price.
• Demonstrate to learners how to calculate VAT inclusive price from a VAT exclusive price.

1. Calculate a VAT inclusive price on a television set with a VAT exclusive price of R7800,60.
   **Method 1:** VAT on VAT exclusive price = 14% of R7800,60
   $= 14\% \times R7800,60$
   $= R1092,08$
   Price + VAT $= R7800,60 + R1092,08$
   VAT inclusive price $= R8892,68$
   **Method 2:** VAT inclusive price = 114% of the VAT exclusive price
   $= 114\% \times 7800,60$
   $= R8892,08$
   • Look under learner activity for some suggested questions. You may include your own.
   • Move round in the classroom while learners are working to monitor their progress and assist where needed.

### Home work

1. The owner of a garden service wants to buy some equipment. Calculate the VAT-inclusive price of a trimmer which costs R700,00 VAT-exclusive. (use both methods 1 and 2)
2. Belinda is starting her own fashion range and needs to price her garments that are going to be showcased during fashion week. Calculate the VAT-inclusive price.

### Table: Price including VAT

<table>
<thead>
<tr>
<th>Items</th>
<th>Price excluding VAT</th>
<th>Price including VAT</th>
</tr>
</thead>
<tbody>
<tr>
<td>Skirt</td>
<td>R80.00</td>
<td></td>
</tr>
<tr>
<td>Skirt short sleeves</td>
<td>R75.00</td>
<td></td>
</tr>
<tr>
<td>Surf shirt</td>
<td>R89.00</td>
<td></td>
</tr>
<tr>
<td>Evening dress</td>
<td>R350.00</td>
<td></td>
</tr>
<tr>
<td>Jackets</td>
<td>R500.00</td>
<td></td>
</tr>
</tbody>
</table>
### 2.3 Conclusion
- Summarise the lesson and make clarifications where needed
- Give learners home work on the lesson presented

**Reflection/Notes:**

**Name of Teacher:**

**HOD:**

**Sign:**

**Sign:**
LESSON SUMMARY FOR: DATE STARTED:

SECTION | CONTENT | CONTEXT | APPLICATION / LESSON OBJECTIVES
--- | --- | --- | ---
Taxation (VAT and UIF) | Vat, types of VAT, VAT-exclusive | Business, salaries, personal income, payslips | Learners should be able to:
• Understand VAT
• Understand VAT inclusive value and value excluding VAT
• Differentiate between VAT inclusive value and value excluding VAT
• Calculate VAT-exclusive price and VAT amount added on VAT-inclusive price

LEARNER ACTIVITIES

Activity
1. A box of Kellogg’s cornflakes is sold at the super market at R30, 95. This is a VAT-inclusive price. Calculate the VAT-exclusive price and the VAT amount (use both methods to calculate the VAT exclusive price)

2. Complete the following Table. Calculate the VAT amount and the VAT-exclusive price for the clothing items that Joseph is selling in his shop

<table>
<thead>
<tr>
<th>Items</th>
<th>VAT-inclusive price</th>
<th>VAT-exclusive price</th>
<th>VAT-amount</th>
</tr>
</thead>
<tbody>
<tr>
<td>Shirt 1</td>
<td>R137,37</td>
<td></td>
<td></td>
</tr>
<tr>
<td>T-Shirt</td>
<td>R18,20</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Jersey</td>
<td>R87,90</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Hat</td>
<td>R45,00</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Jackets (polar fleece)</td>
<td>R36,77</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Jacket (formal)</td>
<td>R300,60</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

TEACHER ACTIVITIES

1 Teaching methods
Question and answer, Discussion, demonstration, telling and explaining

2.1 Introduction
a. Pre-knowledge required for the lesson
• Knowledge of percentage
• Knowledge of VAT
b. Baseline assessment:
Do corrections to the homework, clarify any misconceptions

2.2 Main Body (lesson presentation)

• Remind learners that VAT stands for **Value added tax**
• Remind learners that certain charges like property rates are already a form of tax, hence no VAT is payable
• Remind learners that VAT is calculated as a percentage of the purchase price
• VAT percentage is 14
• Tell learners that the cost of goods or services are given in two ways:
  1. VAT exclusive price, 14% to be added.
  2. VAT inclusive prices, 14% already added
• Tell learners that in this lesson will focus on **VAT exclusive** price

TIMING

Baseline: 10 min
Activity: 45 min
Conclusion: 5 min

RESOURCES NEEDED

Newspapers
Calculators
Magazines
chalkboard
Explain to learners that when they have VAT exclusive price, the VAT amount must be calculated and added to the reflected price.

Tell learners that if VAT is excluded the final value is 114% of the given value.

Tell learners that most items we buy on the shop supermarkets i.e. Pick n' Pay are VAT excluded, thus when you pay then VAT is included at the bottom of a till slip (provide learners with an example of a till slip).

Demonstrate to learners how to calculate VAT exclusive price from a VAT inclusive price.

1. Calculate a VAT-exclusive price of a chainsaw which costs R969.00 VAT-exclusive and VAT amount

   **Method 1:** VAT inclusive price = 100% + 14% = 114%
   
   VAT-exclusive price = 100%
   
   114% of VAT exclusive price = R969.00 (divide both sides by 114%)
   
   1% of VAT exclusive = R969.00 ÷ 114% (since VAT-exclusive = 100 times both sides by 100%)
   
   100% of VAT-exclusive = (R969.00 ÷ 114) x 100% = R850
   
   VAT inclusive price = R850.00
   
   **Method 2:** divide the VAT inclusive price by 1.14 (114%)
   
   VAT-exclusive = VAT inclusive price ÷ 1.14
   
   = R969.00 ÷ 1.14
   
   = R850.00
   
   VAT amount = VAT inclusive - VAT exclusive
   
   = R969.00 - R850.00
   
   = R119.00 (this is the VAT amount added to VAT inclusive Price)

2. Look under learner activity for some suggested questions. You may include your own.

   Move round in the classroom while learners are working to monitor their progress and assist where needed.

### 2.3 Conclusion

- Summarise the lesson and make clarifications where needed.
- Give learners home work on the lesson presented.
<table>
<thead>
<tr>
<th>Name of Teacher:</th>
<th>HOD:</th>
</tr>
</thead>
<tbody>
<tr>
<td>Sign:</td>
<td>Sign:</td>
</tr>
<tr>
<td>Date:</td>
<td>Date:</td>
</tr>
</tbody>
</table>
**LESSON SUMMARY FOR: DATE STARTED:**

<table>
<thead>
<tr>
<th>SECTION</th>
<th>CONTENT</th>
<th>CONTEXT</th>
<th>APPLICATION / LESSON OBJECTIVES</th>
</tr>
</thead>
<tbody>
<tr>
<td>Taxation (VAT and UIF)</td>
<td>UIF, net pay, gross pay</td>
<td>Business, salaries, personal income, payslips</td>
<td>Learners should be able to:</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>• Explain UIF</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>• Develop an understanding why UIF is deducted</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>• Understand the relationship between UIF and gross salary/income</td>
</tr>
</tbody>
</table>

**TEACHER ACTIVITIES**

1. Teaching methods:
   - Question and answer, Discussion, demonstration, telling and explaining

2.1 Introduction
   a. Pre-knowledge required for the lesson
   - Knowledge of percentage
   - Knowledge of VAT
   - Knowledge of salary slips
   b. Baseline assessment: Seen under learner activity

2.2 Main Body (lesson presentation)
   - Inform learners that when you work for an employer, the law states that you must receive a pay slip every time you are paid
   - Discuss with learners this that are to be contained in a pay slip
     - The period you are being paid for
     - How much you were paid (gross salary)
     - How much deductions were made
     - How much was paid into your bank account (Nett income)
   - Tell learners that in this section we are going to focus in one of the deductions that has to be done on a person’s salary, that is UIF
   - Tell learners that UIF stands for Unemployment Insurance Funds
   - Explain to learners that this is an insurance fund for when a person loses their job, they can claim the portion of their earnings from the funds for a limited time. This is relevant to certain categories of workers and employers i.e. private companies

**LEARNER ACTIVITIES**

Baseline assessment

1. What is gross salary?
2. What is net salary?
3. What are deductions?

Activity

1. Why is UIF deducted from the worker’s salary?
2. What are the benefits to the employee?
3. What are the responsibilities of the employer
4. Write down the Maximum monthly basic income amount that may be used to calculate UIF
5. How much percentage should be deducted from the worker by the employee
6. How much percentage should an employer pay on the UIF on behalf of the employee
7. Look at the pay slip below and answer the questions:

**TIMING**

Baseline: 10 min

Activity: 45 min

Conclusion: 5 min

**RESOURCES NEEDED**

Newspapers
Calculators
Magazines
chalkboard
Explain to learners that the UIF is a form of tax that employers are responsible for deducting it from the employee’s income every month and paying this contribution over to SARS on behalf of each employee.

Explain to learners that this deduction amount to 1% of the employee’s salary and the employer must also contribute 1% to the fund on behalf of each employee. This is equal to the deduction made from the salary.

Tell learners that the employer must therefore pay 2% of each worker’s pay every month to the funds (UIF).

Tell learners that this UIF is calculated from the gross salary, and the maximum income in which this 1% is calculated from is R149736 per annum/ R12 487 per month/ R2 879.53 per week.

Discuss with the learners what employers may not do/do: deduct more than 1%; deduct outstanding amounts when they fall behind with payment; and may not ask a fee for deducting. If employers deduct too much money by accident, they must pay the extra money back to the workers.

Discuss the benefits covered by UIF: Unemployment; illness; maternity; Adoption; death.

Look under learner activity for some suggested questions. You may include your own.

Move round in the classroom while learners are working to monitor their progress and assist where needed.

2.3 Conclusion

• Summarise the lesson and make clarifications where needed.

• Give learners home work on the lesson presented.

8.

BRA JOES’ CHAIN STORES
PAYSLIP

<table>
<thead>
<tr>
<th>Employee: Brezhnev Nkosi</th>
<th>Pay Period: May 2005</th>
</tr>
</thead>
<tbody>
<tr>
<td>ID number: 750928614080</td>
<td>Pay Cycle: Monthly</td>
</tr>
<tr>
<td>Bank Details: Old Mutual Bank</td>
<td></td>
</tr>
<tr>
<td>Tax Number: 123456789</td>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Earnings</th>
<th>Amount</th>
<th>Deductions</th>
<th>Amount</th>
</tr>
</thead>
<tbody>
<tr>
<td>Basic Salary</td>
<td>3,000.00</td>
<td>Taxation</td>
<td>15.18</td>
</tr>
<tr>
<td></td>
<td></td>
<td>UIF</td>
<td>3.00</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Christmas Fund</td>
<td>10.00</td>
</tr>
<tr>
<td>Gross Earnings</td>
<td>3,000.00</td>
<td>Total Deductions</td>
<td>28.18</td>
</tr>
<tr>
<td></td>
<td></td>
<td>NET SALARY TRANSFERRED</td>
<td>2971.82</td>
</tr>
</tbody>
</table>

pay sip 1
pay slip 2

1. How much contribution to UIF has been paid in each pay slip?
2. What is the gross salary in each pay slip?
# Lesson Summary

**Section**: Taxation (VAT and UIF)  
**Content**: UIF, net pay, gross pay  
**Context**: Business, salaries, personal income, payslips  
**Application / Lesson Objectives**: Learners should be able to:  
- Calculate UIF value  
- Understand the relationship between UIF and gross salary/income

## Teacher Activities

1. **Teaching methods**: Question and answer, Discussion, demonstration, telling and explaining

2.1 **Introduction**  
- Pre-knowledge required for the lesson  
  - Knowledge of percentage  
  - Knowledge of UIF  
  - Knowledge of salary slips  
- Baseline assessment: Seen under learner activity

2.2 **Main Body (lesson presentation)**  
- Tell learners that UIF is calculated from the employer’s salary (gross salary).  
- Explain to learners that gross salary is the total salary that an employee earns. This includes basic salary and any additional income such as overtime pay, before any deduction are made  
- Tell learners that the employer deduct 1% from the employee and the employer also contribute 1% towards the employees fund  
- Explain to learners that the total contribution to the fund for each employee is 2%  
- Tell learners that this UIF is calculated from the gross salary, and

<table>
<thead>
<tr>
<th>LEARNER ACTIVITIES</th>
<th>TIMING</th>
<th>RESOURCES NEEDED</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Baseline assessment</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>1. What is gross salary?</td>
<td>Baseline: 10 min</td>
<td>Newspapers</td>
</tr>
<tr>
<td>2. What is UIF?</td>
<td>Activity: 45 min</td>
<td>Calculators</td>
</tr>
<tr>
<td>3. What percentage is deducted for UIF from employer’s salary?</td>
<td>Conclusion: 5 min</td>
<td>Magazines</td>
</tr>
<tr>
<td><strong>Activity</strong></td>
<td></td>
<td>chalkboard</td>
</tr>
</tbody>
</table>
| 1. For each of these basic salary (gross salary)  
  a. Calculate the employee’s contribution to UIF  
  b. The total paid into the UIF in respect of the employee’s earning  
  i. Jabu earns a basic salary of R2 350,00  
  ii. Leti earns a basic salary of R12430,00  
  iii. Murphy earns basic salary of R1200,00  
  iv. Mondi earns a basic salary of R5425,75  
  v. Nonqaba earns a basic salary of R8 350  
  2. Look at the pay slip below and answer the questions: |
the maximum income in which this 1% is calculated from is R149736 per annum/ R12 487 per month/ R2 879.53 per week

- Demonstrate to learners how to calculate the UIF:
  - John earns a basic salary of R3425.75.
  1. Calculate his UIF contribution
     **UIF contribution is 1% of the basic salary**
     UIF amount = 1% x R3425.75
     = R34.26
  2. How much is paid to the UIF in respect to John’s earning?
     - **The amount paid to the UIF includes 1% of his earnings from the employer.**
     - **Amount paid to UIF = R34,26 x 2**
       = R68.52

- Look under learner activity for some suggested questions. You may include your own.
- Move round in the classroom while learners are working to monitor their progress and assist where needed.

2.3 Conclusion
- Summarise the lesson and make clarifications where needed
- Give learners home work on the lesson presented
1. How much contribute to UIF has been paid in each pay slip
2. What is the gross salary in each pay slip
3. Show how the UIF amount was calculated
LESSON SUMMARY FOR: DATE STARTED:                  DATE COMPLETED:

SECTION  CONTENT         CONTEXT                  APPLICATION / LESSON OBJECTIVES

Taxation (VAT and UIF) VAT, UIF, net pay, gross pay Business, salaries, personal income, payslips

Learners should be able to:
- Understand and calculate VAT-inclusive price and VAT-exclusive price
- Calculate UIF value
- Understand the relationship between UIF and gross salary/income

TEACHER ACTIVITIES

1  Teaching methods
   Question and answer.

2.1 Introduction
   a. Pre-knowledge required for the lesson
   • Knowledge of percentage
   • Knowledge of UIF
   • Knowledge of salary slips
   b. Baseline assessment:
      Not available as they are writing a test

2.2 Main Body (lesson presentation)
   • Remind learners about VAT-inclusive and VAT exclusive
   • Remind learners about UIF and the benefits
   • Give learners the test questions under learner activity.
   • Move round in the classroom while learners are working to monitor their progress. Let them write under control exam environment
   • When learners are done you can ask learners to change their scripts (peer marking)
   • Provide learners with the corrections

2.3 Conclusion
   • Summarise the lesson and make clarifications where

   LEARNER ACTIVITIES

   Activity
   1. What is VAT-inclusive price? (2)
   2. What is VAT-exclusive price? (2)
   3. What is UIF? 
   4. What is the employee’s contribution percentage to the UIF? (1)
   5. Give three benefits of UIF. (3)
   6. Nina bought a jersey. The VAT exclusive price of the jersey is R100,00. Calculate the VAT-inclusive price of the jersey. (3)
   7. Andrew paid R100,00 for a pair of tekkies after bargaining with a vendor at the stall. Determine the VAT-exclusive price of the tekkies. (3)
   8. Niki and John have the following argument: Niki pays R180,00 for a jersey. John calculates that the VAT-exclusive price of the jersey is R216. Niki says is R225. Who is correct? Provide calculations to support your answer. Explain the reasoning mistake that was made by the one who is incorrect. (6)
   9. Copy and complete the table to indicate the contributions payable to UIF for the employees: (9)

   Monthly deduction from employee salary Monthly contribution payable by the employer Total monthly contribution payable to UIF

   Basic monthly salary of employee
   R7543,00

   TIMING

   Activity: 50 min
   Conclusion: 10 min

   RESOURCES NEEDED

   Newspapers
   Calculators
   Magazines
   Chalkboard
needed

- Give learners home work on the lesson presented

<table>
<thead>
<tr>
<th>R15 767.00</th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>R10 450</td>
<td></td>
<td></td>
</tr>
<tr>
<td>TOTAL UIF CONTRIBUTION</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

pay slip 2

1. How much contribute to UIF has been paid in each pay slip
2. What is the gross salary in each pay slip
3. Show how the UIF amount was calculated

Reflection/Notes:

Name of Teacher: [ ]
HOD: [ ]
Sign: [ ]
Sign: [ ]
LESSON SUMMARY FOR: DATE STARTED: |
---|---
LESSON CONTENT | CONTEXT | LEARNER LESSON OBJECTIVES |
Expressions of probability and predictions | Expressions of probability. | personal lives, wider community |

LEARNER ACTIVITIES |
---|---
1. **Baseline** assessment
   a. Write down two events that will never happen
   b. Write two events that will happen
   c. Place the following events in a likelihood scale
      1. Seeing a new born baby driving a car
      2. The number 3 appearing when you throw a die
      3. The next child born in a hospital being a boy
   d. What is the probability of tossing a coin and getting a head?

2. **Activity**
   2.1 What is the mathematical probability of getting a tail when you toss a coin?
   2.2 Conduct a short investigation using a 5c coin. Create a table with the following headings:

<table>
<thead>
<tr>
<th>No. of toss</th>
<th>H</th>
<th>T</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td></td>
<td></td>
</tr>
<tr>
<td>2</td>
<td></td>
<td></td>
</tr>
<tr>
<td>total</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
Tell learners that the weather expects use the history of past weather system to predict future weather.

Explain to learners that a probability scale of 0-100% is used when reading the weather report maps.

Explain to learners how the weather people are able to make a prediction on a particular day i.e. 80% chance it will rain, they look at historical data base of all other days they see the same characteristics, and determine that on 80% of similar days in the past it rain.

Tell learners that even the doctors use probability predictions based on previous diagnose with the same or similar cases i.e. predict the possible behaviour of individual after brain injury. For example there is 68% chance that you will be unproductive if the injury is severe. Show learners that to calculate the probability of getting odd numbers is done as follows:

\[ P(\text{odd}) = \frac{\text{favourable outcomes}}{\text{No. of equally likely outcomes}} \]

\[ \frac{3}{6} = \frac{1}{2} \]

Frequency is likely to be close to 0.5.

Give learners some questions to. See under learner activity for some questions.

Move round in the classroom while learners are working to monitor their progress and assist where needed.

Give learners home work. See under learner activity for some questions.

**Conclusion**

Summarise the lesson and make clarifications where needed.

Give learners home work on the lesson presented.

---

- a. Toss the coin 10 times and record your observation using a tick. At the end write the total of the ticks for each. Calculate the relative frequency of getting a tail.

- b. Toss the coin 40 times and add to the other 10 and end up with the toss of 50 times. Calculate the relative frequency when it is tossed 50 times, for the tail.

- c. Which one is closer to the mathematical probability.

**Home work**

Jenny and mark rolled a 8-sided die 50 times and recorded the results as follows:

<table>
<thead>
<tr>
<th>No. on the die</th>
<th>50 times</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>13</td>
</tr>
<tr>
<td>2</td>
<td>4</td>
</tr>
<tr>
<td>3</td>
<td>3</td>
</tr>
<tr>
<td>4</td>
<td>11</td>
</tr>
<tr>
<td>5</td>
<td>7</td>
</tr>
<tr>
<td>6</td>
<td>9</td>
</tr>
<tr>
<td>7</td>
<td>3</td>
</tr>
<tr>
<td>8</td>
<td>0</td>
</tr>
</tbody>
</table>

1. What is the probability of getting a 4?
2. What is the probability of getting a 7?
3. What is the relative frequency of getting a 4?
4. What is the relative frequency of getting a 7?
5. They roll the die another 100 times and record the total out of 150 times:
<table>
<thead>
<tr>
<th>No. on the die</th>
<th>150 times</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>24</td>
</tr>
<tr>
<td>2</td>
<td>21</td>
</tr>
<tr>
<td>3</td>
<td>15</td>
</tr>
<tr>
<td>4</td>
<td>20</td>
</tr>
<tr>
<td>5</td>
<td>16</td>
</tr>
<tr>
<td>6</td>
<td>21</td>
</tr>
<tr>
<td>7</td>
<td>15</td>
</tr>
<tr>
<td>8</td>
<td>18</td>
</tr>
<tr>
<td>LESSON SUMMARY FOR: DATE STARTED:</td>
<td>DATE COMPLETED:</td>
</tr>
<tr>
<td>----------------------------------</td>
<td>----------------</td>
</tr>
<tr>
<td><strong>SECTION</strong></td>
<td><strong>CONTENT</strong></td>
</tr>
</tbody>
</table>
| Expressions of probability and predictions | Expressions of probability. | Learners should be able to:  
- Predict about the future based on events on the past  
- Use probability scale and relative frequency to predict the future event that is related to real life situations  
*personal lives, wider community* |

### TEACHER ACTIVITIES

- **Teaching methods:** Question and answer, Discussion, demonstration
- **Introduction:**  
  - Pre-knowledge required for the lesson  
  - Probability scale, what is probability  
  - Knowledge of probability concept i.e. certain, impossible, even,  
  - Calculation of theoretical probability
- **Baseline assessment:** Revise the concepts of probability with the learners and provide them with the questions under learner activity.
  Do corrections to the baseline activity
- **Main Body (lesson presentation):**  
  - Tell learners that generally the predictions that are made about the future in the society are based in the past i.e. car insurance rates are higher for age group 18-25 than age group of 30-55. This because in the past there has been higher rate of vehicle accidents involving 18-25 age group than 30-35 age  
  - Explain to learners that probability can be used to predict weather conditions

### LEARNER ACTIVITIES

1. **Activity**
   1.1. In the newspapers and media the following icons are used to describe the type of weather predicted.
      
      ![Weather Icons]

      a. describe the prediction that is indicated by each of these icons
      b. predict in your own words the weather described in the table below

      | **Min 5 °C** | **Max 16 °C** |
      |------------|------------|
      | 80% |

### TIMING

- Baseline: 10 min
- Activity: 45 min
- Conclusion: 5 min

### RESOURCES NEEDED

- Newspapers
- Calculators
- Magazines
- chalkboard
Tell learners that the weather expects use the history of past weather system to predict future weather

Explain to learners that a probability scale of 0-100% is used when reading the weather report maps

Explain to learners how the weather people are able to make a prediction on a particular day i.e. $80\%$ chance it will rain, they look at historical data base of all other days they see the same characteristics, and determine that on $80\%$ of similar days in the past it rain

Tell learners that even the doctors use probability predictions based on previous diagnose with the same or similar cases i.e. predict the possible behaviour of individual after brain injury. For example there is $68\%$ chance that you will be unproductive if the injury is severe. Show learners that to calculate the probability of getting odd numbers is done as follows:

$$P(\text{odd}) = \frac{\text{favourable outcomes}}{\text{No. of equally likely outcomes}} = \frac{3}{6} = \frac{1}{2}$$

E.g. if the data from the weather forecast for 100 days and on 80 of these days it rained, the probability that it will rain the next similar day is $80/100$ or $0.8$.

Give learners some questions. See under learner activity for some questions.

Move round in the classroom while learners are working to monitor their progress and assist where needed.

Give learners home work. See under learner activity for some questions.

### Conclusion

Summarise the lesson and make clarifications where needed

Give learners home work on the lesson presented

c. in another country the following prediction was given, what is the prediction described?

```
<table>
<thead>
<tr>
<th></th>
<th>Min</th>
<th>Max</th>
</tr>
</thead>
<tbody>
<tr>
<td>20%</td>
<td>5°C</td>
<td>6°C</td>
</tr>
</tbody>
</table>
```

d. What would prediction be for no rain

1.2. The weather forecast in various cities predict the following for the next day:

- $0.3$ probability of rain, in Cape Town South Africa
- $0.6$ probability of rain in Johannesburg, Gauteng
- $0.8$ probability of no rain in Nice, Italy
- No chance of rain in Cairo, Egypt

a. List the cities mention above in increasing order of chance of rain. Write their prediction in percentages

b. In which of these cities is likely to rain?

1.3. The table below demonstrate two long term outcomes (unproductive and dependence) after moderate as well as after severe brain injury.

<table>
<thead>
<tr>
<th>Injury severity</th>
<th>Follow-up period</th>
<th>unproductive</th>
<th>dependence</th>
</tr>
</thead>
<tbody>
<tr>
<td>Moderate</td>
<td>3 month -2years</td>
<td>80%</td>
<td>40%</td>
</tr>
<tr>
<td></td>
<td>3-5 years</td>
<td>35%</td>
<td>30%</td>
</tr>
<tr>
<td></td>
<td>Greater than 5yrs</td>
<td>15%</td>
<td>10%</td>
</tr>
<tr>
<td>Severe</td>
<td>3 month -2years</td>
<td>90%</td>
<td>62%</td>
</tr>
<tr>
<td></td>
<td>3-5 years</td>
<td>60%</td>
<td>23%</td>
</tr>
<tr>
<td></td>
<td>Greater than 5yrs</td>
<td>42%</td>
<td>38%</td>
</tr>
<tr>
<td>Question</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>------------------------------------------------------------------------</td>
<td>---</td>
<td></td>
<td></td>
</tr>
<tr>
<td>a. What is the likelihood that a person who sustained a moderate brain injury can return to work in six months?</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>b. What are the chances that a person who sustained a moderate brain injury can return to work in four years time?</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>c. What is the probability that a person who sustained a severe brain injury will be independent within 3 months to two years?</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>d. Would you consider the doctor’s results to be invalid when he declares a person who has sustained a severe brain injury 20 years ago to be dependent? Explain.</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

**Reflection/Notes:**

**Name of Teacher:**

**HOD:**

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**Sign:**

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**Date:**
## LESSON SUMMARY FOR: DATE STARTED:

<table>
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<tr>
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<th>APPLICATION / LESSON OBJECTIVES</th>
</tr>
</thead>
</table>
| Expressions of probability and predictions | Expressions of probability. | personal lives, wider community | Learners should be able to:  
- Predict the accuracy probability of some test results  
- Use probability scale and relative frequency to predict the accuracy of the results/event that is related to real life situations |

### TEACHER ACTIVITIES

- **Teaching methods:**  
  Question and answer, Discussion, demonstration
- **Introduction:**  
  Pre-knowledge required for the lesson  
  Probability scale, what is probability  
  Knowledge of probability concept i.e. certain, impossible, even,  
  Calculation of theoretical probability

- **Main Body (lesson presentation):**  
  Baseline assessment:  
  Revise the concepts of probability with the learners and clarify any misconceptions

### LEARNER ACTIVITIES

**1. Activity**

1.1. Suppose that a drug test for an illegal is such that it is 99% accurate in the case of drug users of that drug, and 89% accurate in the case of non-user of drug. Suppose it is known that 8% of the entire population really uses this drug.

   a. What is the probability that the test gives a ‘Yes’ to the tested individual who really uses this illegal drug?

   b. What is the probability that the test gives ‘Yes’ to the tested individual who does not use this illegal drug?

   c. Can you say this test is reliable?

1.2. How is probability used in a pregnancy test?

1.3. The statistic shown in the table below represent the recording of the HCG hormone level at the end of each month in the blood of a particular pregnant women.

<table>
<thead>
<tr>
<th>Months</th>
<th>0</th>
<th>1</th>
<th>2</th>
<th>3</th>
<th>4</th>
<th>5</th>
<th>6</th>
<th>7</th>
</tr>
</thead>
<tbody>
<tr>
<td>HCG levels</td>
<td>0</td>
<td>3</td>
<td>15</td>
<td>30</td>
<td>30</td>
<td>25</td>
<td>20</td>
<td>15</td>
</tr>
</tbody>
</table>

**TIMING**

Baseline: 10 min  
Activity: 45 min  
Conclusion: 5 min

**RESOURCES NEEDED**

Newspapers  
Calculators  
Magazines  
chalkboard
have to think:
It could be wrong when it says ‘Yes’
It could be wrong when it says ‘No’
• Tell learners that a use of table to predict the accuracy of the results could be better way to understand the test
• E.g. suppose that a drug test for an illegal drug is such that it is 98% accurate in the case of users and 90% accurate in the case of non-users of the drug

<table>
<thead>
<tr>
<th></th>
<th>Test says ‘Yes’</th>
<th>Test says ‘No’</th>
</tr>
</thead>
<tbody>
<tr>
<td>Users of drugs</td>
<td>98% true positive</td>
<td>2% false negative</td>
</tr>
<tr>
<td>Non-users of drugs</td>
<td>10% false positive</td>
<td>90% true negative</td>
</tr>
</tbody>
</table>

• Discuss with learners how to interpret the table and make prediction in terms of accuracy
  People using the drug, test results says ‘yes’ 98% of time (98% it is true positive i.e. has a probability of 0.98 of being accurate).
• Explain to learners that accuracy probability of some test can also be determine by using two different methods:
  1. The knowledge of percentage of affected people in the entire society e.g. the drug test
  2. Knowledge of the amount of secreted hormone in the blood of the person e.g. pregnancy tests
• Discuss with learners these methods and how accurate are they and what factors can affect them.
Pregnancy test – there are two types, urine and blood test. A test measures the exact amount of hormones in the blood stream and it can be detected after 7-12 days of fertilisation. A pregnant woman is expected to show a normal pattern of the levels of pregnancy hormones HGC (human chorionic Gonadotropin) over time. Therefore, there is a certain level of HGC hormones in terms of units, that is used to determine whether a person is pregnant or not.

a. What is the probability of detecting that a woman is pregnant at the end of one month? Explain.
b. After the end of which month is it likely that the pregnancy is positive? Explain
c. What can you say about the probability of pregnancy at the end of 3 months? Explain
not. The amount of HGC level indicates the probability of pregnancy and for a pregnant woman the HGC hormone level must be equal or greater than 5 units.

- Give learners questions. See under learner activity for some questions.
- Move round in the classroom while learners are working to monitor their progress and assist where needed.
- Give learners homework. See under learner activity for some questions.

- **Conclusion**
- Summarise the lesson and make clarifications where needed
- Give learners home work on the lesson presented

### Reflection/Notes:

<table>
<thead>
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<td>Sign:</td>
<td>Sign:</td>
</tr>
<tr>
<td>Date:</td>
<td>Date:</td>
</tr>
</tbody>
</table>
# GRADE 11: Mathematical Literacy
## WEEK 8
### Term 3
#### TOPIC: Patterns, relationships and Probability

**Time:** 60min

**WEEK 8**

**TOPIC:** Patterns, relationships and Probability

**Time:** 60min

---

## Lesson 4

### LESSON SUMMARY FOR:

<table>
<thead>
<tr>
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<tbody>
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<td>Expressions of probability.</td>
<td>personal lives, wider community</td>
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</tbody>
</table>

**APPLICATION / LESSON OBJECTIVES**

Learners should be able to:
- Understand products making statement regarding probability
- Use probability scale and relative frequency to predict the accuracy of the results/event that is related to real life situations

---

### TEACHER ACTIVITIES

- **Teaching methods:**
  - Question and answer,
  - Discussion,
  - Demonstration

- **Introduction**
  - Pre-knowledge required for the lesson
  - Probability scale, what is probability
  - Knowledge of probability concept i.e. certain, impossible, even,
  - Calculation of theoretical probability

- **Baseline assessment:**
  - Revise the concepts of probability with the learners and clarify any misconceptions

- **Main Body (lesson presentation)**
  - Explain to learners that probability and prediction also applies to advertisement, it is used to sell the products by giving information based on previous event or outcomes. i.e. 80% of people who use this product have lost weight in three months.
  - Tell learners that modern science is often based on statements of statistical significance and probability.
  - Tell learners that the statements used by products manufactures are based on probability as they are using comparison in terms of

### LEARNER ACTIVITIES

1. **Activity**

   1.1. Sisa saw an advertisement of a roll-on deodorant and he was impressed by the following probability statement:

       ‘98% of the people who use this product reported that they never suffered from lumps on the armpit’

       a. What is the probability that using this product does not result in lumps on the armpit?

       b. Why is it uncertain that using this product does not result in lumps?

       c. Does it mean that a person who has suffered no lumps using this product for a period of time will never suffer from lumps?

       d. What are possible causes that the probability of not having 100%?

1.2. PREVAGE face advanced anti-ageing serum advert made a probability statement that: ‘ 8 in 10 women who used this product experienced improvement in radiance and brightness after a 12 week clinical test conducted on 32 women’?

   a. If 40 women used the product how many of them might

---

**Timing**

- Baseline: 10 min
- Activity: 45 min
- Conclusion: 5 min

**Resources Needed**

- Newspapers
- Calculators
- Magazines
- Chalkboard
users and non-users and percentage benefits or use ratio or fraction to sell the products

For example:
1. 80% of people who use this product now have no acne. The benefit percentage is 80%. This means that the product has a likely probability of clearing acne, 0.8 but not certain. Since there is a 0.2 probability that the acne may not be cleared
2. when using comparison: the probability of developing breast cancer is almost 10 times greater for lipstick users than for non-lipstick users
3. 8 in 10 women experienced improvement in radiance and brightness after 12 week of using the product. This is describing the success rate of using the product, by using the ratios. This means for every 10 women who use the cream 8 may experience improved skin (or 2 will experience no change). 8/10 = 0.8 probability that your skin may improve but not certain, it’s likely

- Give learners some questions. See under learner activity for some questions.
- Move round in the classroom while learners are working to monitor their progress and assist where needed.
- Give learners home work. See under learner activity for some questions.

\underline{Conclusion}
- Summarise the lesson and make clarifications where needed
- Give learners home work on the lesson presented

experience improvement in their skin?

b. Explain why the answer that you determine in a. is a prediction and not certain?

c. Calculate the probability of experiencing improvement in their skin

1.3. The advertisement states that the statistic ‘8 in 10 women’ is based on a clinical trial of 32 women.

a. How many of the 32 women experienced improvement? Calculate their probability

b. Why do you think the advertisement does not state the test results as --- in 32 women?

c. Why do you think the advertisement does not state the test result as a percentage?

d. Why do you think the advertisement does not state the test result as a decimal?

\underline{Homework}

A beauty cream company tested a group of 500 volunteers and recorded the following results:

- 100% reported improved skin softness and smoothness
- 90% reported that the skin feels softer and smoother
- 87% reported that the skin feels moisturised all day
- 80% reported it enriches skin with deep moisture
- 75% reported that the skin looks healthier
- 88% reported it improve the skin overall appearance
- 72% reported it evens skin tones and texture
- 70% reported it minimises the appearance of fine lines and wrinkles

a. What was the most successful result?

b. What were the least successful results?

c. What percentage of people reported that their skin was enriched?

d. How many people did not notice a softer, smoother skin
<p>| | |</p>
<table>
<thead>
<tr>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>e. Is it correct to say that the cream always makes skin feels softer and smoother?</td>
<td></td>
</tr>
</tbody>
</table>

**Reflection/Notes:**

**Name of Teacher:**

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**Date:**
### Lesson Summary
**DATE STARTED:**
**DATE COMPLETED:**

<table>
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<tbody>
<tr>
<td>Expressions of probability and predictions</td>
<td>Expressions of probability.</td>
<td>personal lives, wider community</td>
<td>Learners should be able to:</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>• Recognise that expressions of probability can only predict the trend of an outcomes over a</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>long period of time</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>• Use probability scale and relative frequency to predict the accuracy of the results/ event</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>that is related to real life situations</td>
</tr>
</tbody>
</table>

#### Teacher Activities
- **Teaching methods:**
  - Question and answer, Discussion, demonstration
- **Introduction**
  - Pre-knowledge required for the lesson
  - Probability scale, what is probability
  - Knowledge of probability concept i.e. certain, impossible, even,
  - Calculation of theoretical probability
- **Baseline assessment:**
  - Revise the concepts of probability with the learners and clarify any misconceptions

#### Learner Activities

1. **Activity**
   1.1. The graph below illustrates the trends of national spending on health care by source of fund from 1975 to 2005:
   - Private funding fell slightly from 59%-55%
   - Public funding share increased slightly from 41% to 55%
   - Out of pocket payments fell from 31% to 13%
   - Payments by private insurers rose from 25% to 37%
over a long period of time. Thus first for women insurance, insures women less than men.

- Discuss with learners the why car insurances rates are higher for younger age group than older group. Does that mean that the older groups will not be in an accident?
- Tell learners that statistics of data collected over a long period of time represented in tables and graph makes it easy to make the prediction and to understand where the prediction made by companies come from
- Give learners some questions. **See under learner activity for some questions.**
- Move round in the classroom while learners are working to monitor their progress and assist where needed.
- Give learners home work. **See under learner activity for some questions.**

**Conclusion**

- Summarise the lesson and make clarifications where needed
- Give learners home work on the lesson presented

a. What can you predict about the total private spending in 2010 if the trend after 1990 does not change?
b. What can you predict about public spending in 2010 if the trend from 1975 does not change?
c. What can you predict about private health insurance in 2010 if the trend from 1975 does not change?
d. What can you predict about out-of-pocket spending in 2010 if the trend from 1990 does not change?
e. Does the prediction made in d. above means, all families were relieved of high payment on out-of-pocket spending? Explain
f. Does it mean that a person who has suffered no lumps using this product for a period of time will never suffer from lumps?

1.2. The table below show the actual numbers of vehicle types involved in accidents for each province.

<table>
<thead>
<tr>
<th>2009</th>
<th>NUMBER OF VEHICLES PER TYPE AND PROVINCE INVOLVED IN FATAL CRASH</th>
</tr>
</thead>
<tbody>
<tr>
<td>Vehicle types</td>
<td>EC</td>
</tr>
<tr>
<td>Motorcar</td>
<td>969</td>
</tr>
<tr>
<td>Mini bus</td>
<td>163</td>
</tr>
<tr>
<td>Buses</td>
<td>66</td>
</tr>
<tr>
<td>Motorcycle</td>
<td>16</td>
</tr>
<tr>
<td>Trucks</td>
<td>111</td>
</tr>
<tr>
<td>Other</td>
<td>95</td>
</tr>
<tr>
<td>Total motorist</td>
<td>1420</td>
</tr>
</tbody>
</table>
a. What is a likelihood that an accident in Kwazulu-Natal (KZN) will involve a motorcar?

b. What is the likelihood of being involved in a bus accident in South Africa (RSA)?

c. Do you have a higher chance of being in an accident in a minibus or bus in Gauteng (GP)?

d. Do you have a higher chance of being in an accident in a minibus in Gauteng KZN or WC?

e. How do you think the police might use this information?
## Lesson Summary

<table>
<thead>
<tr>
<th>SECTION</th>
<th>CONTENT</th>
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</tr>
</thead>
<tbody>
<tr>
<td>Representations for determining possible outcomes</td>
<td>Contingency table</td>
<td>personal lives, wider community</td>
</tr>
</tbody>
</table>

### Learner Objectives

Learners should be able to:
- Describe a contingency table
- Use contingency table to make predictions concerning the combination of a probability of simple or independent event in the context of game and real life situations.

#### Teacher Activities

- **Teaching methods:**
  - Question and answer, Discussion, demonstration

- **Introduction**
  - Pre-knowledge required for the lesson
  - Probability scale, what is probability
  - Knowledge of probability concept i.e. certain, impossible, even,
  - Calculation of theoretical probability

- Baseline assessment:
  - Revise the concepts of probability with the learners and provide them with the questions under learner activity.
  - Do corrections to the baseline activity

- **Main Body (lesson presentation)**

  - Explain to learners that a tree diagram is used to determine the probability of compound events. When two independent events are happening at the same time, all the number of equal likely outcomes can be shown using a tree diagram.
  - Demonstrate to learners how to draw a tree diagram:
    - e.g. if you toss the coin twice, use a tree diagram to indicate all outcomes.

- **1. Activity**

  Draw a tree diagram for tossing a coin then a die. From the tree diagram answer the following questions:

  a. What is the total number of outcomes?
  b. What is the probability of getting a head and a 6?
  c. What is the probability of getting a 4
  d. What is the probability of getting a tail and even number?

### Homework

Thandeka has four different shirt (blue, white, green and red) and three pairs of pants (plain, striped and checked)

1. Draw a tree diagram to indicate how many combination of shirt and trousers are possible?
2. What is the probability that she will wear a green shirt and plain trouser?
3. What is the probability that she will wear a red shirt with any trouser?
the possible outcomes
Step 1: write the possible outcome of the first event i.e. first toss of the coin

First toss

\[
\begin{align*}
\frac{1}{2} & \quad H \\
\frac{1}{2} & \quad T
\end{align*}
\]

Step 2: On the tree for the first toss add the tree for the second toss. Indicating the possible outcome in each branch

Second toss of the coin

\[
\begin{align*}
\text{2nd} & \quad H & \quad H;H \\
\frac{1}{2} & \quad T & \quad H;T \\
\frac{1}{2} & \quad H & \quad T;H \\
\frac{1}{2} & \quad T & \quad T;T
\end{align*}
\]

Step 3: indicate all the possible outcomes in each branch or arm of the tree.

Step 4: count the possible outcome of the event i.e. there are 4 \[H;H, H;T, T;H, T;T]\]

\[ H;H = \frac{1}{2} \times \frac{1}{2} = \frac{1}{4} \approx \frac{1}{2} \] similar to other outcomes

- Give learners some questions to draw a tree diagram. See under learner activity for some questions.

- Move round in the classroom while learners are working to monitor their progress and assist where needed.

- Give learners homework. See under learner activity for some questions.
• **Conclusion**
  • Summarise the lesson and make clarifications where needed
  • Give learners home work on the lesson presented

**Reflection/Notes:**

<table>
<thead>
<tr>
<th>Name of Teacher:</th>
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<tr>
<td>Sign:</td>
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<tr>
<td>Date:</td>
<td>Date:</td>
</tr>
</tbody>
</table>
**Representations for determining possible outcomes**

- **Contingency table**
- **Context**: personal lives, wider community

**Learners should be able to:**
- Describe a contingency table
- Use contingency table to make predictions concerning the combination of a probabilities of simple or independent event in the context of game and real life situations

**TEACHER ACTIVITIES**

- **Teaching methods**
  - Question and answer, Discussion, demonstration
- **Introduction**
  - Pre-knowledge required for the lesson
  - Probability scale, what is probability
  - Knowledge of probability concept i.e. certain, impossible, even
  - Calculation of theoretical probability
- **Baseline assessment**
  - Revise the concepts of probability with the learners and provide them with the questions under learner activity.
  - Do corrections to the baseline activity
- **Main Body (lesson presentation)**
  - Explain to learners that a tree diagram is used to determine the probability of compound events. When two independent events are happening at the same time, all the number of equal likely outcomes can be shown using a tree diagram.
  - Tell learners that tree diagram can also be used to check the probability of a test being accurate, when it is done for more than once.

**LEARNER ACTIVITIES**

1. **Activity**

   Every time a woman takes a pregnancy test there is a 97% chance of an accurate reading and a 3% chance of an inaccurate reading (false positive or false negative). Complete the tree diagram below to represent the scenario of taking a test three times.

   ![Tree Diagram](image)

   - **Test 1**: Accurate (97%)
   - **Test 2**: Inaccurate (3%)

   - a. What is the total number of outcomes?
   - b. What is the probability of getting accurate result for all three tests?

1.2. Suppose a company –wide drug test is 99% sensitive and 97% specific, that is the test will produce 99% true positive and 97% true negative results. Suppose that 0.5% of people are users of...

**TIMING**

- Baseline: 10 min
- Activity: 45 min
- Conclusion: 5 min

**RESOURCES NEEDED**

- Newspapers
- Calculators
- Magazines
- Chalkboard
- Coins, die
Tell learners that their knowledge about pregnancy tests and other test will be used in this lesson to represent the same information on the tree diagram to see how easy will it be to see the prediction.

Tell learners we are looking at these test if they are done more than once and see their certainty.

Give learners some questions to draw a three diagram. **See under learner activity for some questions.**

- Move round in the classroom while learners are working to monitor their progress and assist where needed.
- Give learners home work. **See under learner activity for some questions.**

**Conclusion**

- Summarise the lesson and make clarifications where needed.
- Give learners home work on the lesson presented.

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### Reflection/Notes:

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</table>

### CONTENT
- Contingency table

### CONTEXT
- Personal lives, wider community

### APPLICATION / LESSON OBJECTIVES

**Learners should be able to:**
- Describe a contingency table
- Use contingency table to make predictions concerning the combination of probabilities of simple or independent event in the context of game and real life situations

---

### TEACHER ACTIVITIES

**Teaching methods:**  
Question and answer, Discussion, demonstration

**Introduction**
- Pre-knowledge required for the lesson
- Calculation of theoretical probability
- Work with compound events
- Draw a tree diagram
- Baseline assessment:
  - Revise the concepts of probability with the learners and provide them with the questions under learner activity.
  - Do corrections to the home work

**Main Body (lesson presentation)**
- Explain to learners that not all the compound events can be expressed using a tree diagram, some events have many numbers or items that will make the tree diagram very untidy. We can use a contingency table.
- Explain that contingency table is used to show the combination of independent events, that take place together, i.e. throwing two dice, finding combination of clothes, combination of exercises

**Learner Activities**

### Activity

1. Thandeka has four different shirts (blue, white, green and red) and three pairs of pants (plain, striped and checked)
   - a. Draw a contingency table to indicate how many combination of shirt and trousers are possible?
   - b. What is the probability that she will wear a green shirt and plain trouser?
   - c. What is the probability that she will wear a red shirt with any trouser?

2. Give learners the worksheet below with a contingency table to answer the questions

### Home work

1. On a scratch card, three different colours (red, yellow, blue) and numbers (5,7,9) are hidden in any order. The winning combination is red and 7. Complete the contingency table below to indicate the possible outcomes:

<table>
<thead>
<tr>
<th>COLOUR</th>
</tr>
</thead>
<tbody>
<tr>
<td>Yellow (Y)</td>
</tr>
<tr>
<td>Red (R)</td>
</tr>
<tr>
<td>Blue (B)</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>NUMBERS</th>
</tr>
</thead>
<tbody>
<tr>
<td>5</td>
</tr>
<tr>
<td>7</td>
</tr>
<tr>
<td>9</td>
</tr>
</tbody>
</table>
Contingency tables can be used to see how one event can influence another.

Demonstrate how the contingency table works:

Two dice, a white and red are thrown simultaneously, show all the possible outcomes:

<table>
<thead>
<tr>
<th>RED DIE</th>
<th>1</th>
<th>2</th>
<th>3</th>
<th>4</th>
<th>5</th>
<th>6</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>1;1</td>
<td>1;2</td>
<td>1;3</td>
<td>1;4</td>
<td>1;5</td>
<td>1;6</td>
</tr>
<tr>
<td>2</td>
<td>2;1</td>
<td>2;2</td>
<td>2;3</td>
<td>2;4</td>
<td>2;5</td>
<td>2;6</td>
</tr>
<tr>
<td>3</td>
<td>3;1</td>
<td>3;2</td>
<td>3;3</td>
<td>3;4</td>
<td>3;5</td>
<td>3;6</td>
</tr>
<tr>
<td>4</td>
<td>4;1</td>
<td>4;2</td>
<td>4;3</td>
<td>4;4</td>
<td>3;5</td>
<td>3;6</td>
</tr>
<tr>
<td>5</td>
<td>5;1</td>
<td>5;2</td>
<td>5;3</td>
<td>5;4</td>
<td>5;5</td>
<td>5;6</td>
</tr>
<tr>
<td>6</td>
<td>6;1</td>
<td>6;2</td>
<td>6;3</td>
<td>6;4</td>
<td>6;5</td>
<td>6;6</td>
</tr>
</tbody>
</table>

Tell learners that when looking at this table there are 36 possible outcomes. You can ask learners few question from the table:
1. What is the probability of getting 5 and 2?
2. What is the probability of getting a sum of 8?

Demonstrate to learners how to interpret a contingency table.
(Provide learners with the copy of the table: check last page of this lesson)

The traffic department wants to determine whether the present of the patrol car on the road discourage the drivers from speeding. Speed limit is 80km/h, for their study they counted the number of cars passing on a particular road on Monday driving below 80km/h, 80-100km/h and above 100km/h.

<table>
<thead>
<tr>
<th>Gender</th>
<th>Core Maths</th>
<th>Mathematical Literacy</th>
<th>Total</th>
</tr>
</thead>
<tbody>
<tr>
<td>Boys</td>
<td>25</td>
<td>18</td>
<td>43</td>
</tr>
<tr>
<td>Girls</td>
<td>13</td>
<td>32</td>
<td>45</td>
</tr>
<tr>
<td>Total</td>
<td>38</td>
<td>50</td>
<td>88</td>
</tr>
</tbody>
</table>

a. Calculate the probability of scratching red and 7
b. What is the probability of scratching a 7 with any colour?

1. The table below shows information on the number of Grade 11 boys and girls at a school who take Core Mathematics and Mathematical Literacy (Maths Lit).

How many girls take Maths Literacy?

What is the probability that a student chosen at random will be a girl?

What is the probability that a student chosen at random would be a boy doing Core Maths?
• Give learners some questions to draw a three diagram. **See under learner activity for some questions.**

• Move round in the classroom while learners are working to monitor their progress and assist where needed.

• Give learners home work. See under learner activity for some questions.

**Conclusion**

• Summarise the lesson and make clarifications where needed

• Give learners home work on the lesson presented

<table>
<thead>
<tr>
<th>SPEED</th>
<th>Below 80km/h</th>
<th>80-100km/h</th>
<th>More than 100km/h</th>
<th>Totals</th>
</tr>
</thead>
<tbody>
<tr>
<td>Patrol car on the road</td>
<td>115</td>
<td>25</td>
<td>20</td>
<td>160</td>
</tr>
<tr>
<td>Patrol car not on the road</td>
<td>90</td>
<td>42</td>
<td>58</td>
<td>190</td>
</tr>
<tr>
<td>Totals</td>
<td>205</td>
<td>67</td>
<td>78</td>
<td>350</td>
</tr>
</tbody>
</table>

This means the total no. of cars when there is a

This means the total no. of cars when there is no a

This means the total no. of cars were monitored that day for both situation

This means the total no. of cars driving below
### Reflection/Notes

<table>
<thead>
<tr>
<th>Name of Teacher:</th>
<th>HOD:</th>
</tr>
</thead>
<tbody>
<tr>
<td>Sign:</td>
<td>Sign:</td>
</tr>
<tr>
<td>Date:</td>
<td>Date:</td>
</tr>
</tbody>
</table>
### Lesson Summary

**Lesson Summary for:**

**Date Started:**

**Date Completed:**

<table>
<thead>
<tr>
<th>Section</th>
<th>Content</th>
<th>Context</th>
<th>Application / Lesson Objectives</th>
</tr>
</thead>
</table>
| Representations for determining possible outcomes | Contingency table | personal lives, wider community | Learners should be able to:  
- Describe a contingency table  
- Use contingency table to make predictions concerning the combination of probabilities of simple or independent event in the context of game and real life situations |

### Teacher Activities

- **Teaching methods:** Question and answer, Discussion, demonstration

- **Introduction:**
  - Pre-knowledge required for the lesson
  - Calculation of theoretical probability
  - Work with compound events
  - Draw a tree diagram

- **Baseline assessment:**
  - Revise the concepts of probability with the learners and provide them with the questions under learner activity.
  - Do corrections to the home work

- **Main Body (lesson presentation):**
  - Explain to learners that not all the compound events can be expressed using a tree diagram, some events have many numbers or items that will make the tree diagram very untidy. We can use a contingency table.
  - Explain that contingency table is used to show the

### Learner Activities

#### Activity

1.1 Use the table below to answer the questions

- a. What is the probability that a woman who uses the product has no wrinkles?
- b. What is a chance a women who use the product has wrinkles
- c. What is the probability that a women who does not use the product has wrinkles
- d. What is the chance that a woman who does not use the product has no wrinkles?
- e. Represent the probabilities calculated in (a) –(d) by a two-way table

1.2. Here is a 7-day weather forecast

<table>
<thead>
<tr>
<th>Timing</th>
<th>Resources Needed</th>
</tr>
</thead>
<tbody>
<tr>
<td>Baseline: 10 min</td>
<td>Newspapers, Calculators</td>
</tr>
<tr>
<td>Activity: 45 min</td>
<td>Magazines, Chalkboard, Coins, die</td>
</tr>
<tr>
<td>Conclusion: 5min</td>
<td></td>
</tr>
</tbody>
</table>

### Resources Needed

- Newspapers
- Calculators
- Magazines
- Chalkboard
- Coins, die
combination of independent events, that take place together. i.e. throwing two dice, finding combination of clothes, combination of exercises

- Contingency tables can be used to see how one event can influence another
- Contingency table can be used also to represent data so that we can be able to make prediction on what will happen. To predict the future events i.e. weather forecast, traffic report, tests, products to show the outcomes:
- Cosmetic company wanted to verify the effectiveness of their product which it claims has resulted 80% of the women who have used their products now having less visible wrinkles. Contingency table used to represent the information:

<table>
<thead>
<tr>
<th></th>
<th>Women with wrinkles (+)</th>
<th>Women with no wrinkles (-)</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Users (+)</strong></td>
<td>160</td>
<td>640</td>
</tr>
<tr>
<td><strong>Non-users (-)</strong></td>
<td>120</td>
<td>80</td>
</tr>
</tbody>
</table>

Discuss these with the learners
- Give learners some questions to read the contingency table. See under learner activity for some questions.
- Move round in the classroom while learners are working to monitor their progress and assist where needed.
- Give learners home work. See under learner activity for some questions.

**Conclusion**
- Summarise the lesson and make clarifications where needed
- Give learners home work on the lesson presented

<table>
<thead>
<tr>
<th>Day</th>
<th>Temp Hi-Lo</th>
<th>Wind speed</th>
<th>humidity</th>
<th>Comfort level</th>
<th>UV index</th>
<th>24hr Precipitation</th>
<th>Prob. Of rain</th>
</tr>
</thead>
<tbody>
<tr>
<td>Sun</td>
<td>Numerous Showers, Morning clouds</td>
<td>16-12°</td>
<td>19-W</td>
<td>71</td>
<td>16</td>
<td>Moderate</td>
<td>8.1</td>
</tr>
<tr>
<td>Mon</td>
<td>Mostly sunny</td>
<td>18-13</td>
<td>28-SSE</td>
<td>68</td>
<td>18</td>
<td>High</td>
<td>10</td>
</tr>
<tr>
<td>Tue</td>
<td>High level clouds</td>
<td>20-24</td>
<td>28-SSW</td>
<td>58</td>
<td>19</td>
<td>High</td>
<td>0</td>
</tr>
<tr>
<td>Wed</td>
<td>High level clouds</td>
<td>19-14</td>
<td>28-SSW</td>
<td>62</td>
<td>18</td>
<td>High</td>
<td>0</td>
</tr>
<tr>
<td>Thurs</td>
<td>Sunny, mild</td>
<td>18-13</td>
<td>18-S</td>
<td>73</td>
<td>18</td>
<td>High</td>
<td>10</td>
</tr>
<tr>
<td>Fri</td>
<td>High level clouds</td>
<td>21-24</td>
<td>37-SSE</td>
<td>52</td>
<td>20</td>
<td>High</td>
<td>0</td>
</tr>
<tr>
<td>Sat</td>
<td>High level clouds</td>
<td>22-16</td>
<td>26-S</td>
<td>63</td>
<td>24</td>
<td>High</td>
<td>0</td>
</tr>
</tbody>
</table>

- a. What is the probability of rain on Sunday? Write your answer as a value between 0-1
- b. What is the probability it will rain on Thursday
- c. According to the forecast, on which days will it definitely not rain.
| Reflection/Notes: |

<table>
<thead>
<tr>
<th>Name of Teacher:</th>
<th>HOD:</th>
</tr>
</thead>
<tbody>
<tr>
<td>Sign:</td>
<td>Sign:</td>
</tr>
<tr>
<td>Date:</td>
<td>Date:</td>
</tr>
</tbody>
</table>
LESSON SUMMARY FOR: DATE STARTED:

SECTION | CONTENT | CONTEXT | APPLICATION / LESSON OBJECTIVES
--- | --- | --- | ---
Representations for determining possible outcomes | Contingency table, tree diagram, prediction | personal lives, wider community | Learners should be able to:
• Use a contingency table to explain probability
• Use tree diagram to prove that a game is fair
• Use contingency table and tree diagram to make prediction concerning the combination of a probabilities of simple or independent event in the context of game

TEACHER ACTIVITIES

- **Teaching methods:**
  - Question and answer, Discussion

- **Introduction**
  - Pre-knowledge required for the lesson
  - Calculation of theoretical probability
  - Work with compound events
  - Draw a tree diagram

- **Baseline assessment:**
  - Revise the concepts of probability with the learners and provide them with the questions under learner activity.

- **Main Body (lesson presentation)**
  - Remind learners on how to calculate the mathematical probability
    \[
    P(\text{event}) = \frac{\text{favourable outcomes}}{\text{No. of equally likely outcomes}}
    \]
  - Remind learners about tree diagram and how to write the probability of the outcomes;

LEARNER ACTIVITIES

**Activity**

1.1 Complete the investigation by following the instruction in the worksheet.
[worksheet is at the end of the lesson plan]

**Solution to Activity:**

<table>
<thead>
<tr>
<th>BAG 1</th>
</tr>
</thead>
<tbody>
<tr>
<td>RED</td>
</tr>
<tr>
<td>RED</td>
</tr>
<tr>
<td>RED</td>
</tr>
<tr>
<td>BLUE</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>BAG 2</th>
</tr>
</thead>
<tbody>
<tr>
<td>RED</td>
</tr>
<tr>
<td>RR</td>
</tr>
<tr>
<td>RR</td>
</tr>
<tr>
<td>RR</td>
</tr>
<tr>
<td>RB</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>RED</th>
</tr>
</thead>
<tbody>
<tr>
<td>RR</td>
</tr>
<tr>
<td>RR</td>
</tr>
<tr>
<td>RR</td>
</tr>
<tr>
<td>RB</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>BLUE</th>
</tr>
</thead>
<tbody>
<tr>
<td>RB</td>
</tr>
<tr>
<td>RB</td>
</tr>
<tr>
<td>RB</td>
</tr>
<tr>
<td>BB</td>
</tr>
</tbody>
</table>

TIMING

Baseline: 10 min  
Activity: 45 min  
Conclusion: 5 min

RESOURCES NEEDED

- Newspapers
- Calculators
- Magazines
- Chalkboard
- Coins, die
\[ P(H;6) = \frac{1}{12} [\frac{1}{2} \times \frac{1}{6}] \text{ or} \]
\[ (T \text{ and even}) = \frac{3}{12} = \frac{1}{4} [\frac{1}{12} + \frac{1}{12} + \frac{1}{12}] \]

- Prepare the material the learners will need to play the game. [use marbles, cut round pieces of colour papers or chart] buy sweets or have old 5c that they can use to play the game
- The game should be played after they have completed the investigation.
- Give learners the investigation See under learner activity for some questions. And instruction
- Go through the investigation with the learners.

**Conclusion**
Summarise the lesson by emphasizing on the key words and their meaning

<table>
<thead>
<tr>
<th>Investigation</th>
<th>BLUE</th>
<th>RB</th>
<th>RB</th>
<th>RB</th>
<th>BB</th>
</tr>
</thead>
</table>

A. Total possible outcomes:
\[
[RR;RR;RR;RR;RR;RR;BB;BB;RB;RB;RB;RB;RB;RB;BR;BR] = 16
\]
B. Outcomes for winning: \[RR;RR;RR;RR;RR;RR;BB;BB\] = 8
C. Outcome for losing:
D. \[[RB;RB;RB;RB;RB;RB;BB;BR]\] = 8

\[ P(\text{winning}) = \frac{8}{16} = \frac{1}{2} = 0.5 \approx 50\% \]
\[ P(\text{losing}) = \frac{8}{16} = \frac{1}{2} = 0.5 \approx 50\% \]

Additional homework tasks must be given to the learners for practice

**Reflection/Notes:**

Grade 11 Mathematics Literacy Lesson Plans

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SOLUTION FOR THE TREE DIAGRAM

**BAG 1**
- \(\frac{3}{4}\)  
  - R

**BAG 2**
- \(\frac{2}{4}\)  
  - R
- \(\frac{2}{4}\)  
  - B
- \(\frac{2}{4}\)  
  - R

**RR**
\[= \frac{3}{4} \times \frac{2}{4} \approx \frac{6}{16}\]

**RB**
\[= \frac{3}{4} \times \frac{2}{4} \approx \frac{6}{16}\]

**BR**
\[= \frac{1}{4} \times \frac{2}{4} \approx \frac{2}{16}\]
\[ P(\text{winning}) = P(\text{RR}) + P(\text{BB}) \]
\[ = \frac{6}{16} + \frac{2}{16} \approx \frac{8}{16} \]

\[ p(\text{losing}) = P(\text{RB}) + P(\text{BR}) \]
\[ = \frac{6}{16} + \frac{2}{16} \approx \frac{8}{16} \]

**Class activity (worksheet)**

**Investigation**

**Total: 35**

**Is it a FAIR GAME?**

**Background:**

Much of the theory behind probability has its roots in gambling and gaming. Probability is a wonderful tool to determine whether a game is fair.

**THE SNAP GAME**

It is a game invented by Jimmy. In this game if you win Jimmy pays you and if he wins you pay Jimmy.

**Material:**
2 Plastic bags (dark), 5 red balls (you can use even marbles that you have painted or cover with the paper covered with the colours)
3 blue balls and paper discs as sweets (cut 10 circles from an A4 paper)

**Instruction:**
Place 3 red balls in one bag and 1 blue; Place 2 red balls and 2 blue balls in another bag

**How to play:**
Choose a ball from each bag
1. If both balls are the same colour Jimmy pays you
2. If the balls are different colour, you pay Jimmy.

**BEFORE PLAYING:**
Investigate if Jimmy’s classmate should play the game, or is the game fair?
To answer this question investigates the probability of winning and loosing.
1. Use the contingency table to determine the probability of winning and losing (15)
2. Use the tree diagram to check the probability of winning and losing is the same as in the contingency table (10)
3. Draw a conclusion from both the method, by telling with reason if the classmate of Jimmy should play the game (5)
4. If it’s a fair game, play with your friend one of you should Jimmy and check if what you have investigated it’s really true. Have fun!!! (5) [Evidence of playing]

[Adapted from Mathematical Literacy Grade 12: Step Ahead series. By: North et al. (2009). Bateleur books (Pty) Ltd]