Theme: Everyday Arithmetic (M-08-056) **CODE B1**	Theme: Everyday Arithmetic (M-08-056) **CODE B1**
Lesson Title: Personal Expenditure	Lesson Title: Personal Expenditure
What is **income**? 1 minute	Answer: An **income** is the money you receive, usually when you are paid to do work.
Theme: Everyday Arithmetic (M-08-056) **CODE B2**	Theme: Everyday Arithmetic (M-08-056) **CODE B2**
Lesson Title: Personal Expenditure	Lesson Title: Personal Expenditure
What is a **personal expenditure?** 1 minute	Answer: A **personal expenditure** is the amount of money you spend yourself. Some personal expenditures are food, clothing, and entertainment.
Theme: Everyday Arithmetic (M-08-056) **CODE B3**	Theme: Everyday Arithmetic (M-08-056) **CODE B3**
Lesson Title: Personal Expenditure	Lesson Title: Personal Expenditure
Write down the formula for calculating **Percentage of income** 1 minute	Answer: **Percentage of income** = $\frac{\text{expenditure}}{\text{income}} \times 100\%$
Theme: Everyday Arithmetic (M-08-056) **CODE B4**	Theme: Everyday Arithmetic (M-08-056) **CODE B4**
Lesson Title: Personal Expenditure	Lesson Title: Personal Expenditure
Mohamed earns Le 8,000,000.00 each month. He spends Le 400,000.00 each month on electricity. What percentage of his income does he spend on electricity? 3 minutes	Answer: **Percentage of Income** = $\frac{\text{Expenditure}}{\text{Income}} \times 100\%$ = $\frac{400{,}000}{8{,}000{,}000} \times 100\%$ = $\frac{4}{80} \times 100\%$ = $\frac{1}{20} \times 100\%$ = 5%

Theme: Everyday Arithmetic (M-08-057) **CODE B5**	Theme: Everyday Arithmetic (M-08-057) **CODE B5**
Lesson Title: Income Tax	Lesson Title: Income Tax
What are **taxes?** 1 minute	Answer: **Taxes** are how a government raises money to cover public costs. For example, tax money pays for hospitals, roads, and schools. Furthermore, **income tax** is an amount that people pay from the money they earn working.
Theme: Everyday Arithmetic (M-08-057) **CODE B6**	Theme: Everyday Arithmetic (M-08-057) **CODE B6**
Lesson Title: Income Tax	Lesson Title: Income Tax
Write down the formula for calculating **income tax** 1 minute	Answer: **Income tax** = income × tax rate Where, **tax rate** is given as a percentage**.** For example, 10% = $\frac{10}{100}$
Theme: Everyday Arithmetic (M-08-057) **CODE B7**	Theme: Everyday Arithmetic (M-08-057) **CODE B7**
Lesson Title: Income Tax	Lesson Title: Income Tax
Solve the following word problem: Martin's income is Le 14,500,000.00 per year. His income tax rate is 12%. How much income tax must he pay for one year? 4 minutes	Answer: **Step 1**: Convert tax rate into fraction. 12% = $\frac{12}{100}$ **Step 2**: Calculate **income tax**. Income tax = income × tax rate = 14,500,000.00 × $\frac{12}{100}$ = 145,000 × 12 = 1,740,000 Martin will pay Le 1,740,000.00 in income tax for 1 year.
Theme: Everyday Arithmetic (M-08-058) **CODE B8**	Theme: Everyday Arithmetic (M-08-058) **CODE B8**
Lesson Title: Sales Tax	Lesson Title: Sales Tax
Define **sales tax** 1 minute	Answer: **Sales tax** is an amount that people pay when they buy something from a store. It can also be called "goods and services tax" (GST).

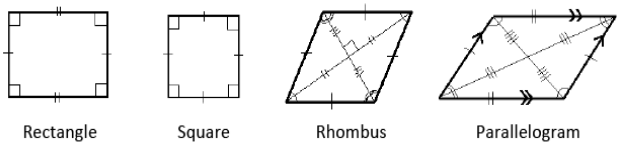
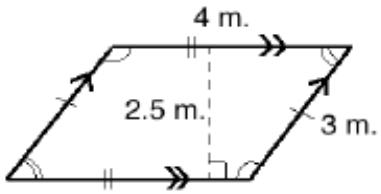
Theme: Everyday Arithmetic (M-08-058) **CODE B9**	Theme: Everyday Arithmetic (M-08-058) **CODE B9**
Lesson Title: Sales Tax	Lesson Title: Sales Tax
Write down the formula for calculating **sales tax** 1 minute	Answer: Sales tax = cost of the item × tax rate
Theme: Everyday Arithmetic (M-08-059) **CODE B10**	Theme: Everyday Arithmetic (M-08-059) **CODE B10**
Lesson Title: Time and Duration	Lesson Title: Time and Duration
Convert the following times to the **12-hour** clock: 1. 05:00 2. 16:00 2 minutes	Answer: 1. 05:00 = **5 am** 2. Subtract 12 from the hours: 16 – 12 = **4 pm**
Theme: Everyday Arithmetic (M-08-059) **CODE B11**	Theme: Everyday Arithmetic (M-08-059) **CODE B11**
Lesson Title: Time and Duration	Lesson Title: Time and Duration
Solve the following word problem: Fatu started working at 9:00 am. She worked for 3 hours and 30 minutes. At what time did she finish working? 2 minutes	Answer: **Add** the hours and minutes separately: 9:00 am + 3:30 = 12:30 pm She finished working at **12:30 pm**
Theme: Everyday Arithmetic (M-08-060) **CODE B12**	Theme: Everyday Arithmetic (M-08-060) **CODE B12**
Lesson Title: Classification of Decimal Numbers	Lesson Title: Classification of Decimal Numbers
Solve the following word problem: Ama has a maths exam tomorrow. She studied in the morning from 7 am to 8:30 am. She studied again in the afternoon from 2:30 to 3:15. How much time did she spend studying all together? 4 minutes	Answer: Ama had two sessions ▪ Time spent studying in the morning: 7:00 – 8:30 = 1:30. She spent 1 hour and 30 minutes. ▪ Time spent studying in the afternoon: 2:30 – 3:15 = 0:45. She spent 45 minutes. **Total time spent studying**: 1 hour 30 minutes + 45 minutes = 1 hour 75 minutes = 2 hours 15 minutes **Answer:** Ama spent 2 hours and 15 minutes studying.

Theme: Measurement and Estimation (M-08-061) **CODE B13**	Theme: Measurement and Estimation (M-08-061) **CODE B13**
Lesson Title: Perimeter and Area of Rectangles and Squares	Lesson Title: Perimeter and Area of Rectangles and Squares
Define area and perimeter. 1½ minutes	Answer: • **Area** is the size of the space inside of a shape. • **Perimeter** is the total length around a shape.

Theme: Measurement and Estimation (M-08-061) **CODE B14**	Theme: Measurement and Estimation (M-08-061) **CODE B14**
Lesson Title: Perimeter and Area of Rectangles and Squares	Lesson Title: Perimeter and Area of Rectangles and Squares
Write down the formulas for calculating the **Perimeter** and **Area** of: 1. a square 2. a rectangle 2½ minutes	Answer: **Shape** | **Perimeter** | **Area** Square | $P = l + l + l + l = 4l$ | $A = l \times l = l^2$ Rectangle | $P = l + l + w + w = 2l + 2w$ | $A = l \times w$ Where: l = length w = width

Theme: Measurement and Estimation (M-08-061) **CODE B15**	Theme: Measurement and Estimation (M-08-061) **CODE B15**
Lesson Title: Perimeter and Area of Rectangles and Squares	Lesson Title: Perimeter and Area of Rectangles and Squares
Find the **perimeter** and **area** of a **square** with sides of 14 cm. 3½ minutes	Answer: 1. **perimeter:** $P = l + l + l + l = 4l$ $= 14 + 14 + 14 + 14$ $= 4(14)$ $= 56$ cm 2. **area:** $A = l \times l = l^2$ $= 14 \times 14$ $= 14^2$ $= 196\ \text{cm}^2$

Theme: Measurement and Estimation (M-08-061) **CODE B16**	Theme: Measurement and Estimation (M-08-061) **CODE B16**
Lesson Title: Perimeter and Area of Rectangles and Squares	Lesson Title: Perimeter and Area of Rectangles and Squares
Find the **perimeter** and **area** of a **rectangle** with a length of 5 metres and a width of 3 metres. 4 minutes	Answer: 1. **perimeter:** $P = l + l + w + w = 2l + 2w$ $= 5 + 5 + 3 + 3$ $= 2(5) + 2(3)$ $= 10 + 6$ $= 16$ m 2. **area:** $A = l \times w$ $= 5 \times 3$ $= 15\ \text{m}^2$

Theme: Measurement and Estimation (M-08-062) **CODE B17**	Theme: Measurement and Estimation (M-08-062) **CODE B17**
Lesson Title: Perimeter and Area of Parallelograms	Lesson Title: Perimeter and Area of Parallelograms
Define a **parallelogram.** 1 minute	Answer: A **parallelogram** is a four-sided plane figure with opposite sides parallel. The following shapes are all types of parallelograms:  Rectangle Square Rhombus Parallelogram
Theme: Measurement and Estimation (M-08-062) **CODE B18**	Theme: Measurement and Estimation (M-08-062) **CODE B18**
Lesson Title: Perimeter and Area of Parallelograms	Lesson Title: Perimeter and Area of Parallelograms
Write down the formulas for calculating the **perimeter** and **area** of: 1. parallelogram 2. rhombus 2 minutes	Answer: **Shape** / **Perimeter** / **Area** Parallelogram: $P = l + l + w + w = 2l + 2w$; $A = b \times h$ Rectangles: $P = l + l + l + l = 4l$; $A = \frac{1}{2}(d_1 \times d_2)$ Where: b = base h = height d_1 and d_2 = diagonals are lines that connect opposite angles.
Theme: Measurement and Estimation (M-08-062) **CODE B19**	Theme: Measurement and Estimation (M-08-062) **CODE B19**
Lesson Title: Perimeter and Area of Parallelograms	Lesson Title: Perimeter and Area of Parallelograms
Find the **perimeter** and **area** of the **parallelogram**:  3½ minutes	Answer: 1. **perimeter:** $P = 2l + 2w$ $= 2 \times 4\text{ m} + 2 \times 3\text{ m}$ $= 8\text{ m} + 6\text{ m}$ $= 14\text{ m}$ 2. **area:** $A = b \times h$ $= 4\text{ m} \times 2.5\text{ m}$ $= 10\text{ m}^2$
Theme: Measurement and Estimation (M-08-062) **CODE B20**	Theme: Measurement and Estimation (M-08-062) **CODE B20**
Lesson Title: Perimeter and Area of Parallelograms	Lesson Title: Perimeter and Area of Parallelograms
A **rhombus** has sides of 5 cm and diagonals of 4 cm and 3 cm. Find: 1. The **area** of the rhombus 2. The **perimeter** of the rhombus 3½ minutes	Answer: 1. **area:** $A = \frac{1}{2}(d_1 \times d_2)$ $= \frac{1}{2}(4 \times 3)$ Substitute values $= \frac{1}{2}(12)$ $= 6\text{ cm}^2$ 2. **perimeter:** $P = 4l$ $= 4 \times 5\text{ cm}$ $= 20\text{ cm}$

Theme: Measurement and Estimation (M-08-063) **CODE B21**

Lesson Title: Perimeter and Area of Trapeziums

Define a **trapezium.**

1 minute

Theme: Measurement and Estimation (M-08-063) **CODE B21**

Lesson Title: Perimeter and Area of Trapeziums

Answer:

A **trapezium** is a quadrilateral with 2 parallel sides. The other 2 sides are not parallel.

Theme: Measurement and Estimation (M-08-063) **CODE B22**

Lesson Title: Perimeter and Area of Trapeziums

Write down the formulas for calculating the **perimeter** and **area** of a **trapezium**:

2 minutes

Theme: Measurement and Estimation (M-08-063) **CODE B22**

Lesson Title: Perimeter and Area of Trapeziums

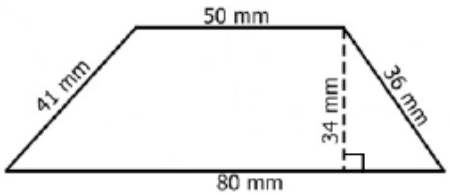
Answer:

Shape	**Perimeter**	**Area**
Trapezium	$P = a + b + c + d$	$A=\frac{1}{2}(a + b)h$

Theme: Measurement and Estimation (M-08-063) **CODE B23**

Lesson Title: Perimeter and Area of Trapeziums

Find the **perimeter** and **area** of the **trapezium** below:



3½ minutes

Theme: Measurement and Estimation (M-08-063) **CODE B23**

Lesson Title: Perimeter and Area of Trapeziums

Answer:

1. **perimeter:** add all the lengths of sides

$$P = a + b + c + d$$
$$= 50 + 36 + 41 + 80$$
$$= 207 \text{ mm}$$

2. **area:** $A = \frac{1}{2}(a + b)h$

$$= \frac{1}{2}(50 + 80)34$$
$$= 2210 \text{ mm}^2$$

Theme: Measurement and Estimation (M-08-064) **CODE B24**

Lesson Title: Perimeter and Area of Triangles

Write down the formulas for calculating the **perimeter** and **area** of a **triangle**:

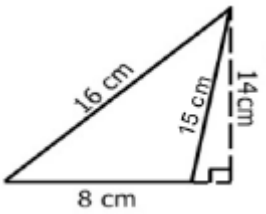
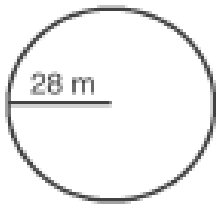
2 minutes

Theme: Measurement and Estimation (M-08-064) **CODE B24**

Lesson Title: Perimeter and Area of Triangles

Answer:

Shape	**Perimeter**	**Area**
Triangle	$P = a + b + c$	$A = \frac{1}{2} \times b \times h$

Theme: Measurement and Estimation (M-08-064) **CODE B25**	Theme: Measurement and Estimation (M-08-064) **CODE B25**
Lesson Title: Perimeter and Area of Triangles	Lesson Title: Perimeter and Area of Triangles
Find the **area** and **perimeter** of the **triangle**:  3½ minutes	Answer: **1. area:** $A = \frac{1}{2} \times b \times h$ $= \frac{1}{2} \times 8 \times 14$ Substitute values $= \frac{1}{2} \times (112)$ Simplify $= 56\ cm^2$ 2. **perimeter:** add all the lengths of sides $P = a + b + c$ $= 16 + 15 + 8 = 39$ cm
Theme: Measurement and Estimation (M-08-065) **CODE B26**	Theme: Measurement and Estimation (M-08-065) **CODE B26**
Lesson Title: Perimeter and Area of Circles	Lesson Title: Perimeter and Area of Circles
Write down the formulas for calculating the **circumference** and **area** of a **circle**: 2 minutes	Answer: | **Shape** | **Circumference** | **Area** | | Circle | $C = 2\pi r$ | $A = \pi r^2$ | Where: r = radius of the Circle $\pi = \frac{22}{7}$
Theme: Measurement and Estimation (M-08-065) **CODE B27**	Theme: Measurement and Estimation (M-08-065) **CODE B27**
Lesson Title: Perimeter and Area of Circles	Lesson Title: Perimeter and Area of Circles
Find the **circumference** and **area** of the **circle**, using $\pi = \frac{22}{7}$  3 minutes	Answer: **1. circumference:** $C = 2\pi r$ $= 2 \times 28 \times \frac{22}{7}$ Substitute values $= 176$ m **2. area:** $A = \pi r^2$ $= \frac{22}{7} \times 28^2$ Substitute values $= \frac{22}{7} \times 784$ Simplify $= 22 \times 112$ Cancel 7 $= 2464\ m^2$
Theme: Measurement and Estimation (M-08-066) **CODE B28**	Theme: Measurement and Estimation (M-08-066) **CODE B28**
Lesson Title: Perimeter and Area of Composite Shapes	Lesson Title: Perimeter and Area of Composite Shapes
Define **composite shapes.** 2 minutes	Answer: **Composite shapes** are shapes made up of one or more different types of shapes. They can be made up of a combination of circles, triangles, rectangles, and other polygons.

Theme: Measurement and Estimation (M-08-067) **CODE B29**

Lesson Title: Perimeter and Area Story Problems

Bright Secondary School has a football field that measures 120 meters on one side and 80 meters on the other side. A gardener is hired to plant carpet grass on the field.

a. Calculate the area of the field.

b. If the cost of carpet grass is Le 200.00 per square meter, how much will it cost to cover the field?

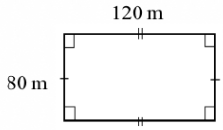
3½ minutes

Theme: Measurement and Estimation (M-08-067) **CODE B29**

Lesson Title: Perimeter and Area Story Problems

Answer:

First, draw a diagram. →



a. Calculate the **area** of the field.

$A = l \times w$

= 120 m × 80 m

= 9,600 m^2

b. Find the cost. Multiply the cost per square meter by the number of square meters.

Cost = 9,600 × Le 200

= Le 1,920,000.00

Theme: Measurement and Estimation (M-08-068) **CODE B30**

Lesson Title: Volume of Solids

Write the general formula for the volume of **prisms** and **cylinders** as cross-sections multiplied by height.

2 minutes

Theme: Measurement and Estimation (M-08-068) **CODE B30**

Lesson Title: Volume of Solids

Answer:

Rectangular Prism: $V = l \times w \times h$ or $V = A \times h$

where *l* is length, *w* is width and *h* is height

Cylinder: $V = \pi r^2$ or $V = A \times h$

where *r* is radius and *h* is height

Theme: Measurement and Estimation (M-08-069) **CODE B31**

Lesson Title: Volume of Cubes

Find the **volume** of a **cube** of side 7 cm.

2½ minutes

Theme: Measurement and Estimation (M-08-069) **CODE B31**

Lesson Title: Volume of Cubes

Answer:

$V = l^3$ formula

$= 7^3$ substitute $l = 4$

$= 7 \times 7 \times 7$ calculate 7^3

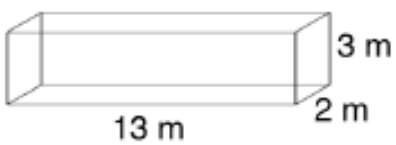
$= 49 \times 7$

$= 343\ cm^3$

Theme: Measurement and Estimation (M-08-070) **CODE B32**

Lesson Title: Volume of Rectangular Prisms

Find the volume of the cuboid bellow:



3 minutes

Theme: Measurement and Estimation (M-08-070) **CODE B32**

Lesson Title: Volume of Rectangular Prisms

Answer:

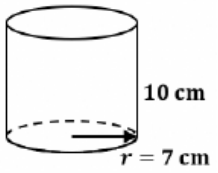
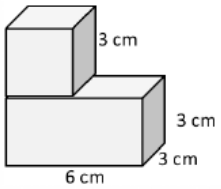
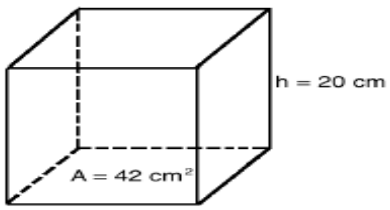
First identify the **length** (l), **width** (w) and **height** (h) of the cuboid.

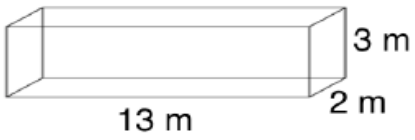
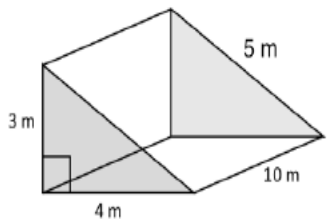
l = 13 m, w = 2 m, h = 3 m

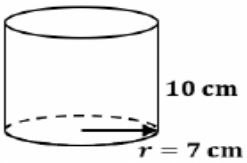
$V = lwh$ formula

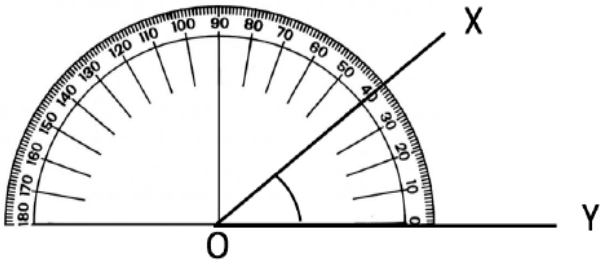
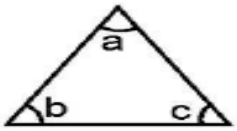
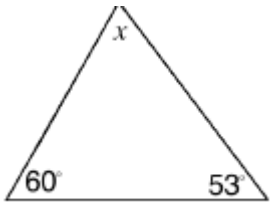
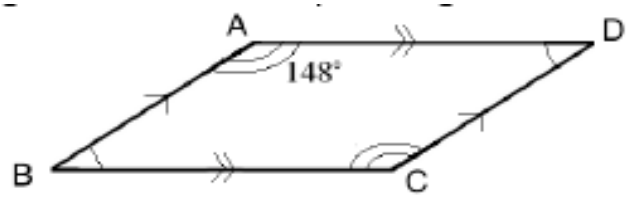
= 13 × 2 × 3 substitute the values

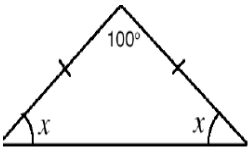
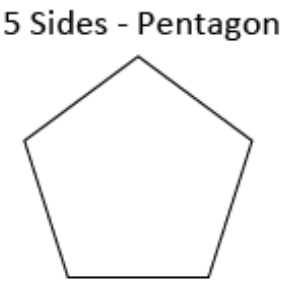
= 78 m^3

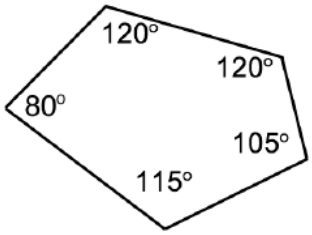
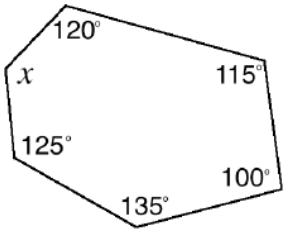
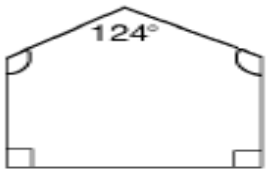
Theme: Measurement and Estimation (M-08-071) **CODE B33**	Theme: Measurement and Estimation (M-08-071) **CODE B33**
Lesson Title: Volume of Triangular Prisms	Lesson Title: Volume of Triangular Prisms
Find the **volume** of a **rectangular prism** with **base** 4 m, **height** 7 m, and **length** 3 m 3 minutes	Answer: V = $\frac{1}{2}bhl$ formula = $\frac{1}{2} \times 4 \times 7 \times 3$ substitute the values = $\frac{1}{2} \times 84$ multiply = 42 cm^3
Theme: Measurement and Estimation (M-08-072) **CODE B34**	Theme: Measurement and Estimation (M-08-072) **CODE B34**
Lesson Title: Volume of Cylinders	Lesson Title: Volume of Cylinders
Find the **volume** of the figure. Use $\pi = \frac{22}{7}$  3 minutes	Answer: V = $\pi r^2 h$ formula = $\frac{22}{7} \times (7)^2 \times 10$ substitute the values = $\frac{22}{7} \times 490$ multiply = 1540 cm^3
Theme: Measurement and Estimation (M-08-073) **CODE B35**	Theme: Measurement and Estimation (M-08-073) **CODE B35**
Lesson Title: Volume of Composite Solids	Lesson Title: Volume of Composite Solids
Find the **volume** of the solid shown:  3½ minutes	Answer: Find the volume of the **cube** (V_1) and the volume of the **rectangular prism** (V_2) separately, then add them to find the **total volume** (V). Volume of **cube**: $V_1 = l^3$ $= (3)^3$ $= 3 \times 3 \times 3$ $= 27\ cm^3$ Volume of **rectangular prism**: $V_2 = lwh$ $= 6 \times 3 \times 3$ $= 54$ cm^3 **Total volume**: $V = V_1 + V_2$ $= 27\ cm^3 + 54$ cm^3 = **81 cm^3**
Theme: Measurement and Estimation (M-08-074) **CODE B36**	Theme: Measurement and Estimation (M-08-074) **CODE B36**
Lesson Title: Volume Story Problems	Lesson Title: Volume Story Problems
A carpenter built a box in the shape of a **rectangular prism**. The area of the bottom of the box is 42 cm^2, and the box is 20 cm tall. How many cubic centimetres of seeds will the box be able to hold? 3½ minutes	Answer: **First, draw a diagram.**  Apply the volume formula: V = $A \times h$ = 42 cm$^3 \times 20$ cm = **840 cm^3**

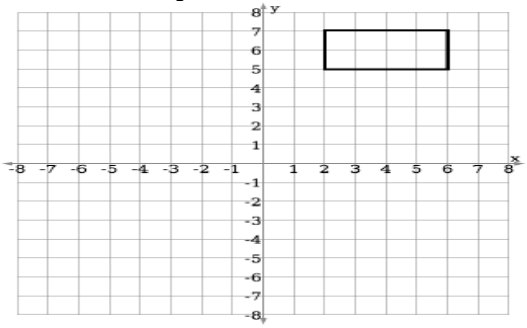
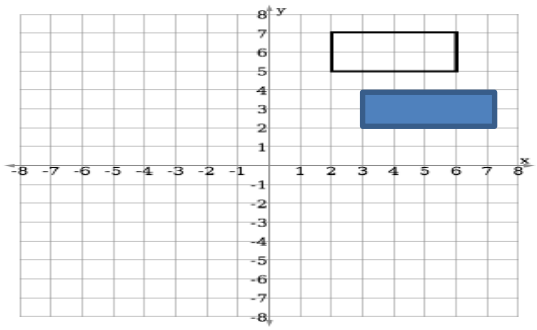
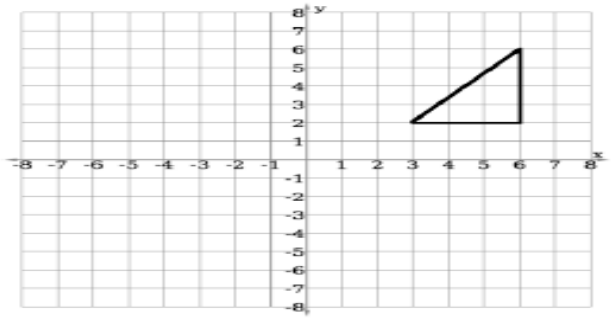
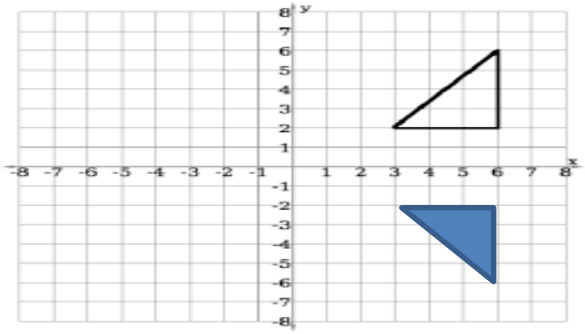
Theme: Measurement and Estimation (M-08-075) **CODE B37**	Theme: Measurement and Estimation (M-08-075) **CODE B37**
Lesson Title: Surface Area of Solids	Lesson Title: Surface Area of Solids
Define the term **surface area.** 1 minute	Answer: **Surface area** is the outside layer of a solid.
Theme: Measurement and Estimation (M-08-075) **CODE B38**	Theme: Measurement and Estimation (M-08-075) **CODE B38**
Lesson Title: Surface Area of Solids	Lesson Title: Surface Area of Solids
A **rectangular prism** has a **length** of 21 m, **width** of 20 m and **height** of 43 m. In what units is the **surface area** measured? 2 minutes	Answer: Surface area is measured in **units squared**. The surface area of this rectangular prism is measured in **m².** This is read as “square metres” or “metres squared”.
Theme: Measurement and Estimation (M-08-076) **CODE B39**	Theme: Measurement and Estimation (M-08-076) **CODE B39**
Lesson Title: Surface Area of Cubes and Rectangular Prisms	Lesson Title: Surface Area of Cubes and Rectangular Prisms
Calculate the **surface area** for the **rectangular prism:**  **Hint:** Use the formula: $SA = 2lw + 2wh + 2lh$ 3½ minutes	Answer: First identify the **length** (l), **width** (w) and **height** (h) of the prism**.** $l = 13$ m, $w = 2$ m, $h = 3$ m surface area for the rectangular prism: $SA = 2lw + 2wh + 2lh$ formula $= 2(13)(2) + 2(2)(3) + 2(13)(3)$ substitute the values $= 52 + 12 + 78$ multiply $=$ **142 m²**
Theme: Measurement and Estimation (M-08-077) **CODE B40**	Theme: Measurement and Estimation (M-08-077) **CODE B40**
Lesson Title: Surface Area of Triangular Prisms	Lesson Title: Surface Area of Triangular Prisms
Find the **surface area** of the right-angled **triangular prism**:  **Hint:** Use the formula: $SA = bh + (a + b + c)\ l$ 3½ minutes	Answer: First identify the values of **a**, ***b***, **c**, **length** (l), **base** (b) and **height** h) of the prism**.** a = 3 m, b = 4 m, c = 5 m, l = 10 m, h = 3 m surface area of the triangular prism: $SA = bh + (a + b + c)\ l$ formula $= (4)(3) + (3 + 4 + 5)10$ substitute the values $= 12 + (12)(10)$ simplify $= 12 + 120$ **= 132 m²**

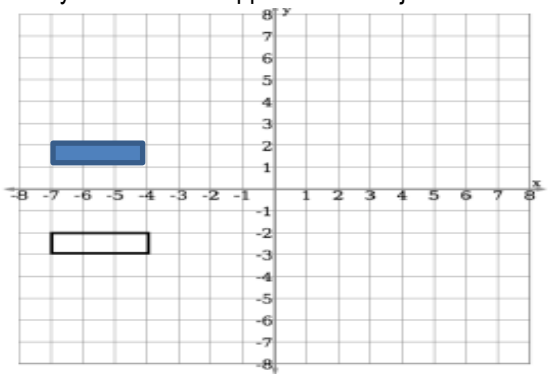
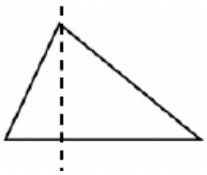
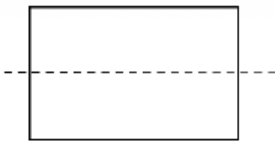
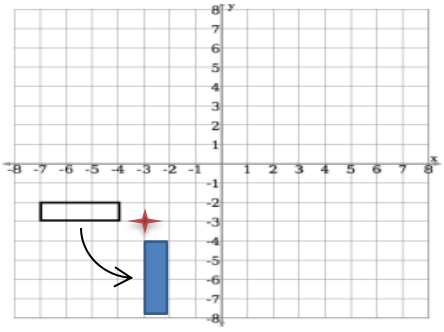
Theme: Measurement and Estimation (M-08-078) **CODE B41**	Theme: Measurement and Estimation (M-08-078) **CODE B41**
Lesson Title: Surface Area of Cylinders	Lesson Title: Surface Area of Cylinders
Find the **surface area** of the **cylinder** shown below. Use $\pi = \frac{22}{7}$ and give your answers to the nearest whole number.  **Hint:** Use the formula: $SA = 2\pi r^2 + 2\pi rh$ 3½ minutes	Answer: surface area of cylinder: $SA = 2\pi r^2 + 2\pi rh$ formula $= 2(\frac{22}{7})(7)^2 + 2(\frac{22}{7})(7)(10)$ substitute the values $= 308 + 440$ simplify $= 748\ cm^2$
Theme: Measurement and Estimation (M-08-080) **CODE B42**	Theme: Measurement and Estimation (M-08-080) **CODE B42**
Lesson Title: Surface Area Story Problems	Lesson Title: Surface Area Story Problems
An open **cylindrical tank** has a radius of 3 metres and a height of 2 metres. Find its surface area to the nearest whole number. (Use $\pi = 3.14$) 3½ minutes	Answer: $SA = 2\pi r^2 + 2\pi rh$ formula $= 2(3.14)(3)^2 + 2(3.14)(3)(2)$ substitute the values $= 56.52 + 37.68$ multiply $= 94.2$ The **surface area** of the **cylindrical tank** to the nearest whole number is 94 m^2
Theme: Geometry (M-08-081) **CODE B43**	Theme: Geometry (M-08-081) **CODE B43**
Lesson Title: Introduction to Angles	Lesson Title: Introduction to Angles
Describe the five types of angles: 1. acute 2. obtuse 3. right 4. straight 5. reflex 5 minutes	Answer: 1. An **acute** is an angle less than 90°. 2. A **right** angle is an angle that is exactly 90°. 3. An **obtuse** angle is an angle that is greater than 90°, but less than 180°. 4. A **straight** angle is an angle that is exactly 180°. 5. A **reflex** angle is an angle greater than 180°, but less than 360°.
Theme: Geometry (M-08-081) **CODE B44**	Theme: Geometry (M-08-081) **CODE B44**
Lesson Title: Introduction to Angles	Lesson Title: Introduction to Angles
Write the following angle measurements in words: 1. 104° 2. 180° 1 minute	Answer: 1. One hundred and four degrees. 2. One hundred and eighty degrees.

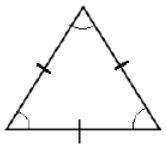
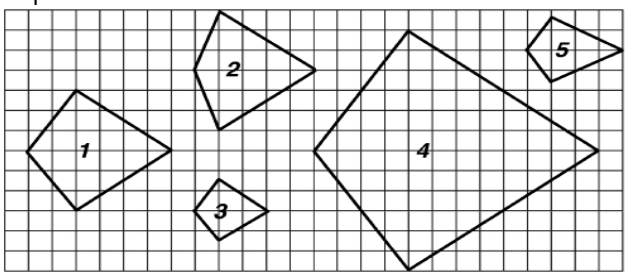
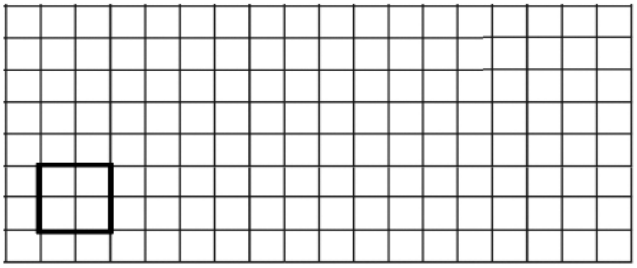
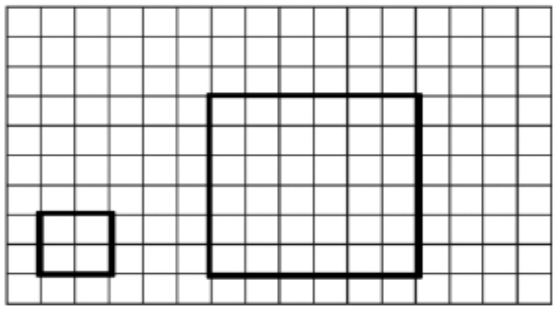
Theme: Geometry (M-08-082) **CODE B45**	Theme: Geometry (M-08-082) **CODE B45**
Lesson Title: Measurement of Angles	Lesson Title: Measurement of Angles
Estimate the measure of the given angle:  2 minutes	Answer: The measure of the angle is $\angle XOY$ = **40°**
Theme: Geometry (M-08-083) **CODE B46**	Theme: Geometry (M-08-083) **CODE B46**
Lesson Title: Finding Unknown Angles in Triangles	Lesson Title: Finding Unknown Angles in Triangles
Define the **interior** angles of a triangle. 2 minutes	Answer: **Interior** angles are angles that are inside the triangle. The sum of these angles is 180°. For example, the angles a, b and c are called **interior** angles of the triangle below.  **And**: a + b + c = 180°.
Theme: Geometry (M-08-083) **CODE B47**	Theme: Geometry (M-08-083) **CODE B47**
Lesson Title: Finding Unknown Angles in Triangles	Lesson Title: Finding Unknown Angles in Triangles
Find the measure of the angle marked x in the triangle below:  3 minutes	Answer: The sum of the interior angles of a triangle is 180°. x + 60° + 53° = 180° x + 113° = 180° x = 180° − 113° x = 67°
Theme: Geometry (M-08-084) **CODE B48**	Theme: Geometry (M-08-084) **CODE B48**
Lesson Title: Finding Unknown Angles in Quadrilaterals	Lesson Title: Finding Unknown Angles in Quadrilaterals
Find the measures of angles B, C and D in the parallelogram:  3 minutes	Answer: Note that C = A because they are opposite angles in a parallelogram. Thus, C = 148°. B and D are unknown angles. A + B + C + D = 360° 148° + B + 148° + D = 360° B + D + 296° = 360° B + D = 360° − 296° B + D = 64° **NOTE**: B = D (opp angles of parallelogram) 2B = 360° − 296° **Hence**: 2B = 64° → B = 32° and D = 32°

Theme: Geometry (M-08-085) **CODE B49**	Theme: Geometry (M-08-085) **CODE B49**
Lesson Title: Angle Practice	Lesson Title: Angle Practice
Calculate the size of ***x*** in the **isosceles triangle** below:  **Remember:** An isosceles triangle has two equal angles. 2 minutes	Answer: $x = x$ equal angles of the isosceles triangle $x + x + 100° = 180°$ $2x = 180° - 100°$ $2x = 80°$ $\frac{2}{2}x = \frac{80°}{2}$ divide both sides of the equation by 2 $x = 40°$
Theme: Geometry (M-08-086) **CODE B50**	Theme: Geometry (M-08-086) **CODE B50**
Lesson Title: Polygons	Lesson Title: Polygons
List any three types of **regular polygons**. 3 minutes	Answer: 1. 5 Sides – **pentagon** 2. 6 Sides – **hexagon** 3. 4 Sides - **quadrilateral**
Theme: Geometry (M-08-086) **CODE B51**	Theme: Geometry (M-08-086) **CODE B51**
Lesson Title: Polygons	Lesson Title: Polygons
Draw the following **polygon**. 5 Sides - pentagon 3 Minutes	Answer:  .
Theme: Geometry (M-08-087) **CODE B52**	Theme: Geometry (M-08-087) **CODE B52**
Lesson Title: Sum of the Interior Angles of a Pentagon	Lesson Title: Sum of the Interior Angles of a Pentagon
Write the formula for calculating the sum of the **interior angles** of a **polygon**. 2 minutes	Answer: Sum of interior angles = $180° (n - 2)$, where n is the number of sides

Theme: Geometry (M-08-087) **CODE B53**	Theme: Geometry (M-08-087) **CODE B53**
Lesson Title: Sum of the Interior Angles of a Pentagon	Lesson Title: Sum of the Interior Angles of a Pentagon
Add the angles of the **pentagon** below to verify that they add up to 540°.  1 minute	Answer: Add the measures of the angles: 120° + 120° + 105° + 115° + 80° = 540° The sum of the angles of the pentagon is 540°.
Theme: Geometry (M-08-088) **CODE B54**	Theme: Geometry (M-08-088) **CODE B54**
Lesson Title: Sum of the Interior Angles of a Polygon	Lesson Title: Sum of the Interior Angles of a Polygon
Calculate the sum of the **interior angles** of a **polygon** with 8 sides **Hint:** Use the formula for the sum of interior angles 3 minutes	Answer: Substitute n = 8 in the formula and solve: Sum of angles = $(n - 2) \times 180°$ = (8 − 2) × 180° = 6 × 180° = 1080°
Theme: Geometry (M-08-089) **CODE B55**	Theme: Geometry (M-08-089) **CODE B55**
Lesson Title: Interior Angle Practice	Lesson Title: Interior Angle Practice
Find the measure of angle *x*:  . 2 minutes	Answer: There are 6 sides and 6 angles in this polygon, which make it a pentagon. The sum of the angles of a pentagon is 720°. Subtract the known angles from 720°: x = 720°− 120° − 115° − 100°− 135°−125° = 125°
Theme: Geometry (M-08-090) **CODE B56**	Theme: Geometry (M-08-090) **CODE B56**
Lesson Title: Interior Angle Story Problems	Lesson Title: Interior Angle Story Problems
Issa is building a house. He wants to build a strong one, and he knows the two angles between the roof and walls must be equal. Help him by finding the missing angles in the diagram of his house.  3 minutes	Answer: His house is in the shape of a pentagon. Remember that the sum of the angles in a pentagon is 540°. First, subtract the 3 known angles. Because the last 2 angles are equal, then divide by 2. **Subtract the known angles:** 540° − 124° − 90° − 90° = 236° **Divide by 2 to find the measure of each angle**: 236° ÷ 2 = 118° The measure of each missing angle is **118°.**

Theme: Geometry (M-08-091) **CODE B57**	Theme: Geometry (M-08-091) **CODE B57**
Lesson Title: Introduction to Transformation	Lesson Title: Introduction to Transformation
What is meant by the **translation** of a shape**?** 1 minute	Answer: If a shape can be moved in any direction, but keeps the same shape and size, then the shape can be translated.
Theme: Geometry (M-08-091) **CODE B58**	Theme: Geometry (M-08-091) **CODE B58**
Lesson Title: Introduction to Transformation	Lesson Title: Introduction to Transformation
What is meant by the **rotation** of a shape**?** 1 minute	Answer: A shape moves or turns around a fixed point. It is still the same shape and size, but faces a different direction.
Theme: Geometry (M-08-092) **CODE B59**	Theme: Geometry (M-08-092) **CODE B59**
Lesson Title: Translation	Lesson Title: Translation
Translate the rectangle on the plane below to 3 units down and 1 unit to the right  3 minutes	Answer: 
Theme: Geometry (M-08-093) **CODE B60**	Theme: Geometry (M-08-093) **CODE B60**
Lesson Title: Reflection	Lesson Title: Reflection
Reflect the shape about the *x*-axis. Where does the reflection lie? 	Answer: 

Theme: Geometry (M-08-093) **CODE B61**	Theme: Geometry (M-08-093) **CODE B61**
Lesson Title: Reflection	Lesson Title: Reflection
Identify the reflection applied to the object:  1 minute	Answer: The object has been reflected about the *x*-axis.
Theme: Geometry (M-08-094) **CODE B62**	Theme: Geometry (M-08-094) **CODE B62**
Lesson Title: Line of Symmetry	Lesson Title: Line of Symmetry
What is meant by **line of symmetry**? 1 minute	Answer: A line that divides a shape into two halves that are exactly equal. If the shape is folded, the two halves will lie exactly on top of each other.
Theme: Geometry (M-08-094) **CODE B63**	Theme: Geometry (M-08-094) **CODE B63**
Lesson Title: Line of Symmetry	Lesson Title: Line of Symmetry
Identify whether the line drawn through each shape is a line of symmetry or not. a.  b.  1 minute	Answer: a. The line is not a line of symmetry. b. The line is a line of symmetry
Theme: Geometry (M-08-095) **CODE B64**	Theme: Geometry (M-08-095) **CODE B64**
Lesson Title: Rotation	Lesson Title: Rotation
Identify the rotation applied to the object about the marked point:  1 minute	Answer: The object has been rotated **90° Counterclockwise.**

Theme: Geometry (M-08-096) **CODE B65**	Theme: Geometry (M-08-096) **CODE B65**
Lesson Title: Rotational Symmetry	Lesson Title: Rotational Symmetry
Determine the following: a. Does the object have rotational symmetry? b. If it does have rotational symmetry, what is its order?  Equilateral triangle 2 minutes	Answer: a. Yes, the equilateral triangle has a rotational symmetry. If we rotate it, it will look exactly the same three times as we turn it around 360°. b. The equilateral triangle has order 3.
Theme: Geometry (M-08-097) **CODE B66**	Theme: Geometry (M-08-097) **CODE B66**
Lesson Title: Enlargement	Lesson Title: Enlargement
Which of the shapes shown below are **not** enlargements of shape 1?  1 minute	Answer: Shapes 2 and 5 are not enlargements of 1.
Theme: Geometry (M-08-097) **CODE B67**	Theme: Geometry (M-08-097) **CODE B67**
Lesson Title: Enlargement	Lesson Title: Enlargement
Draw an enlargement of the square with scale factor 3.  2 minutes	Answer: 
Theme: Algebra (M-08-101) **CODE B68**	Theme: Algebra (M-08-101) **CODE B68**
Lesson Title: Arithmetic Patterns	Lesson Title: Arithmetic Patterns
What is an **arithmetic pattern**? 1 minute	Answer: Arithmetic pattern is a list of numbers that have a **common difference** between two consecutive terms. Consider the number pattern: 5, 7, 9, 11, 13 **Common difference:** 2 2 2 2

Theme: Algebra (M-08-101) **CODE B69**	Theme: Algebra (M-08-101) **CODE B69**
Lesson Title: Arithmetic Patterns	Lesson Title: Arithmetic Patterns
Identify whether each of the following lists of numbers is an arithmetic pattern. If it is an arithmetic pattern, give the common difference: a. 8, 16, 24, 32, … b. 1, 4, 7, 10, 13, … c. 3, 6, 12, 24, 48, … 3 minutes	Answer: a. Arithmetic pattern with common difference 8 b. Arithmetic pattern with common difference 3 c. Not an arithmetic pattern
Theme: Algebra (M-08-101) **CODE B70**	Theme: Algebra (M-08-101) **CODE B70**
Lesson Title: Arithmetic Patterns	Lesson Title: Arithmetic Patterns
Find the common difference and write the missing numbers in each pattern: 15, 11, ____, 3, –1 , _____ 1 minute	Answer: **Pattern**: 15, 11, 7, 3, –1, –5 **Common difference:** –4
Theme: Algebra (M-08-102) **CODE B71**	Theme: Algebra (M-08-102) **CODE B71**
Lesson Title: Creating Arithmetic Patterns	Lesson Title: Creating Arithmetic Patterns
Write an arithmetic pattern starting with **0**, with a **common difference** of **4**. Write the first 6 terms of the pattern. 1 minute	Answer: Pattern: 0, 4, 8, 12, 16, 20.
Theme: Algebra (M-08-103) **CODE B72**	Theme: Algebra (M-08-103) **CODE B72**
Lesson Title: Introduction to Geometric Patterns	Lesson Title: Introduction to Geometric Patterns
Determine whether each of the following lists of numbers is a geometric pattern. If it is a geometric pattern, give the common ratio: a. 10, 30, 50, 70, … b. −2, 6, −18, 54, … c. −1, −3, −5, −7, … 3 minutes	Answer: a. Not a geometric pattern. b. Geometric pattern with common ratio –3 c. Not a geometric pattern.

Theme: Algebra (M-08-104) **CODE B73**	Theme: Algebra (M-08-104) **CODE B73**
Lesson Title: Terms of Geometric Patterns	Lesson Title: Terms of Geometric Patterns
Find the common ratio and write the missing numbers in each pattern 3, 9, _____, _____, _____, … 1 minute	Answer: **Pattern**: 3, 9, 27, 81, 243 **Common ratio**: 3
Theme: Algebra (M-08-105) **CODE B74**	Theme: Algebra (M-08-105) **CODE B74**
Lesson Title: Creating Geometric Patterns	Lesson Title: Creating Geometric Patterns
Write a geometric pattern starting with −1, with a common ratio of −2. Write the first 4 terms of the pattern. 1 minute	Answer: **Pattern:** −1, 2, −4, 8, …
Theme: Algebra (M-08-106) **CODE B75**	Theme: Algebra (M-08-106) **CODE B75**
Lesson Title: Simplifying Algebraic Expressions	Lesson Title: Simplifying Algebraic Expressions
What are **like terms**? 1 minute	Answer: In algebra, **like terms** are terms that have the same variable, and the variables have the same power. **Example**: $5p^2$ and $8p^2$ are like terms, with the variable p to the power 2. **Example**: $3x$ and x are like terms with x raised to the power of 1.
Theme: Algebra (M-08-106) **CODE B76**	Theme: Algebra (M-08-106) **CODE B76**
Lesson Title: Simplifying Algebraic Expressions	Lesson Title: Simplifying Algebraic Expressions
Simplify the following algebraic expressions: a. $10x$ – 5y + $2y$ − $7x$ + 6 b. $3u$ − 3 + $4v$ − $2u$ + 7 − $2v$ 3 minutes	Answer: a. $10x$ – 5y + $2y$ − $7x$ + 6 = (10 – 7) x + (–5 + 2)y + 6 = $3x$ – 3y + 6 b. $3u$ − 3 + $4v$ − $2u$ + 7 − $2v$ = $3u$ − $2u$ + $4v$ − $2v$ + 7 − 3 = u + $2v$ + 4

Theme: Algebra (M-08-107) **CODE B77**	Theme: Algebra (M-08-107) **CODE B77**
Lesson Title: Simplifying Expressions with Higher Powers	Lesson Title: Simplifying Expressions with Higher Powers
Consider the algebraic expression: $x^3 + 7x - x^2 + 3x + 8x^3 + 4x^2$ a. Simplify the expression. b. How many terms are there in this simplified algebraic expression? 3 minutes	Answer: a. $x^3 + 7x - x^2 + 3x + 8x^3 + 4x^2$ $= (1 + 8)\,x^3 + (-1 + 4)\,x^2 + (7 + 3)\,x$ $= 9x^3 + 3x^2 + 10x$ b. The algebraic expression has 3 terms
Theme: Algebra (M-08-108) **CODE B78**	Theme: Algebra (M-08-108) **CODE B78**
Lesson Title: Simplifying Expressions with Fractions	Lesson Title: Simplifying Expressions with Fractions
Simplify: $6 + \frac{1}{2}x^2 + x - \frac{1}{4}x^2 + 2x^1 - 4x^3$ 2 minutes	Answer: $6 + \frac{1}{2}x^2 + x - \frac{1}{4}x^2 + 2x^1 - 4x^3$ $= -4x^3 + \frac{1}{2}x^2 - \frac{1}{4}x^2 + x + 2x + 6$ $= -4x^3 + \left(\frac{1}{2} - \frac{1}{4}\right)x^2 + (1 + 2)x + 6$ $= -4x^3 + \frac{1}{4}x^2 + 3x + 6$
Theme: Algebra (M-08-108) **CODE B79**	Theme: Algebra (M-08-108) **CODE B79**
Lesson Title: Simplifying Algebraic Expressions	Lesson Title: Simplifying Algebraic Expressions
Simplify: $8 + \frac{5}{6}x^2 + \frac{1}{3}x + \frac{1}{3}x^2 + \frac{1}{5}$ 2 minutes	Answer: $8 + \frac{5}{6}x^2 + \frac{1}{3}x + \frac{1}{3}x^2 + \frac{1}{5}$ $= \frac{5}{6}x^2 + \frac{1}{3}x^2 + \frac{1}{3}x + \frac{1}{5} + 8$ $= (\frac{5}{6} + \frac{1}{3})x^2 + \frac{1}{3}x + (\frac{1}{5} + 8)$ $= \frac{7}{6}x^2 + \frac{1}{3}x + \frac{41}{5}$
Theme: Algebra (M-08-110) **CODE B80**	Theme: Algebra (M-08-110) **CODE B80**
Lesson Title: Multiplying Variables	Lesson Title: Multiplying an Algebraic Expression by an Integer
Remove brackets and simplify the following algebraic expressions: a. $-7x^5(-x^2 + y^3)$ b. $100w(x^2 - 3w^2)$ c. $2(p^2 - p + 5)$ 3 minutes	Answer: a. $7x^7 - 7x^5y^3$ b. $100wx^2 - 300w^3$ c. $2p^2 - 2p + 10$

Theme: Algebra (M-08-112) **CODE B81**

Lesson Title: Simplifying and Expanding Algebraic Expressions

Expand and simplify:

$2a\,[(a + 3b) + 4(2a - b)]$

2 minutes

Theme: Algebra (M-08-112) **CODE B81**

Lesson Title: Simplifying and Expanding Algebraic Expressions

Answer:

Hint: Use **BODMAS**

$2a\,[(a + 3b) + 4(2a - b)]$
$= 2a\,(a + 3b + 8a - 4b)$
$= 2a\,(a + 8a + 3b - 4b)$
$= 2a\,(9a - b)$
$= 18a^2 - 2ab$

Theme: Algebra (M-08-113) **CODE B82**

Lesson Title: Algebraic Expression Story

Solve the following word problems:

1. Hawa is twice as old as Musa. If Musa is $x + 3$ years old, write an expression for Hawa's age.

2. A man has $15x$ sheep and $10y$ goats. He sells $6x$ sheep and $2y$ goats. How many animals are left after the sales?

2 minutes

Theme: Algebra (M-08-113) **CODE B82**

Lesson Title: Algebraic Expression Story

Answer:

1. Musa's age $= 2(x + 3)$

$= 2x + 6$

animals sold

2. Total animals left $= 15x + 10y - (6x + 2y)$
$= 9x + 8y$

Theme: Algebra (M-08-114) **CODE B83**

Lesson Title: Factoring Integers from Algebraic Expressions

Factorise the following expressions:

1. $5x^3 + 15x^2 + 35x + 20$

2. $10s + 12t - 4t$

2 minutes

Theme: Algebra (M-08-114) **CODE B83**

Lesson Title: Factoring Integers from Algebraic Expressions

Answer:

1. $5x^3 + 15x^2 + 35x + 20 = 5(\ )$ **take out the HCF, 5**
$= 5(x^3 + 3x^2 + 7x + 4)$ **divide each term by 5**

2. $10s + 12t - 4t = 2(\ )$ **take out the HCF, 2**
$= 2(5s + 6t - 2t)$ **divide each term by 2**

Theme: Algebra (M-08-115) **CODE B84**

Lesson Title: Factoring Variables from Algebraic Expressions

Factorise the following expressions:

a. $x^3 + 5x^2$

b. $9a^2 + 13a - 3a - 4a^2$

3 minutes

Theme: Algebra (M-08-106) **CODE B84**

Lesson Title: Simplifying Algebraic Expressions

Answer:

a. $x^3 + 5x^2 = x^2(\ )$ the HCF is x^2
$= x^2(x + 5)$ divide each term by x^2

b. $9a^2 - 4a^2 + 13a - 3a$ collect like terms
$= (9 - 4)\,a^2 + (13 - 3)\,a$ combine like terms
$= (5)a^2 + (10)a$
$= 5a\,(a + 2)$ factorise and divide each term by $5a$