

ACTIVITY EXAMPLE



KEY WORDS

Finance | percentages | decimals | number | height | width | length | calculations | measurement | area | diameter | circumference | radius | perimeter | costs

ALSO USEFUL FOR

Business studies | Accounting | Finance | Sport & Recreation

PROGRAMME OUTLINE

This resource was created to support online learning during Covid-19 lockdowns as a follow up to a classroom session and workplace visit by Council Finance staff prior to lockdown. It can be used as a stand-alone video and worksheet for distance learning or be incorporated into classroom sessions.

1. **Student activity:** watch the **Matamata-Piako District Council Services and Facilities video** in the SSEP Resource Centre Video Library. Pause the video when needed to **take notes for calculations in the worksheet.**
2. Students use their notes from the video to complete the worksheet below.



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Parks and Reserves – Maintaining Sports Grounds

Pohlen Park

(1) Mowing

The mowing area of Pohlen Park is 200m by 217m.

- i) Calculate the total perimeter of the mowing area (m)
- ii) Calculate the area of grass for mowing (m²)
- iii) The mower is 4m wide and travels at a speed of 9km per hour. How long would it take to mow the area?

(2) Soccer fields

We need to repaint the lines and markings of the soccer field at Pohlen Park for the Winter season.

Width =

Length =

- (i) **Using page 8 of the Resource Sheets** (or your own grid paper), draw a soccer field to scale with these measurements.
- (ii) Calculate the area and perimeter of the soccer field.

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(2) Soccer fields continued

(iii) Using the diagram on page 6 of the **Resource Sheets**, draw in the field markings (to scale) on your soccer field with the following instructions:

- Half-way line
- Centre spot
- Centre circle radius = 9.15m
- Penalty box = 16.m x 40.3m
- Goal box = 5.5m x 18.3m
- Penalty spot: 11m from goal line and in line with centre spot
- Penalty arc radius = 9.15m from penalty spot
- Corner arc radius = 1m

(iv) Using your diagram and the details above, calculate the total length of all the markings (excluding centre spot and penalty spots).

Field perimeter + centre circle perimeter + half-way line length + penalty box perimeter + goal box perimeter + penalty arc + corner arcs

(2) Soccer fields continued

(vi) One 750mL can of paint will paint a line that is 50m in length. How many cans of paint will you need to mark out the soccer field?

(vii) Calculate the total volume of paint needed to mark the soccer field (in litres).

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- (viii) Each can of paint costs \$69.95. What will be the total cost of paint to mark the soccer field?
- (ix) The average person walks at a speed of 1.4m per second (84m a minute). If you maintained this speed, how long would it take you to paint the soccer field?

Building Consents

Building Consent Fees

(3) Building a new house

Using the example from the video, and the information on the resource sheet, calculate the building consent fees for a new house with the following specifications:

- ⇒ 2 storey dwelling
- ⇒ 247m² area
- ⇒ Estimated value of \$350,000

iv) Cost of building consent fees:

v) BRANZ Levy fee:
 $\text{\$Value} \times (\text{\$1} \div \text{\$1000})$

vi) MBIE Levy fee:
 $\text{\$Value} \times (\text{\$2.01} \div \text{\$1000})$

vii) Total costs:

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(4) Calculate the building consent fees for a new house with the following specifications:

- ⇒ 1 storey dwelling
 - ⇒ 185m² area
 - ⇒ Estimated value of \$280,000
- i) Cost of building consent fees:
- ii) BRANZ Levy fee:
- iii) MBIE Levy fee:
- iv) Total costs:

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Rubbish and Recycling

Rubbish Bags

Costs to provide rubbish collection and run transfer stations =
Revenue from dump fees =
Income from general rates =

1) How much does Council need to collect from the sale of rubbish bags?

Price per rubbish bag =

Price excluding GST =

Supermarket margin =

Number of rubbish collection customers =

2) How much does Council make per bag excluding GST and the supermarket margin?

3) To gain the required funding, how many bags need to be sold each year?

4) How many bags would each customer need to buy?

If Council increased the price per bag to \$2.50,

5) How much would Council make per bag excluding GST and the supermarket margin?

6) To gain required funding, how many bags need to be sold each year?

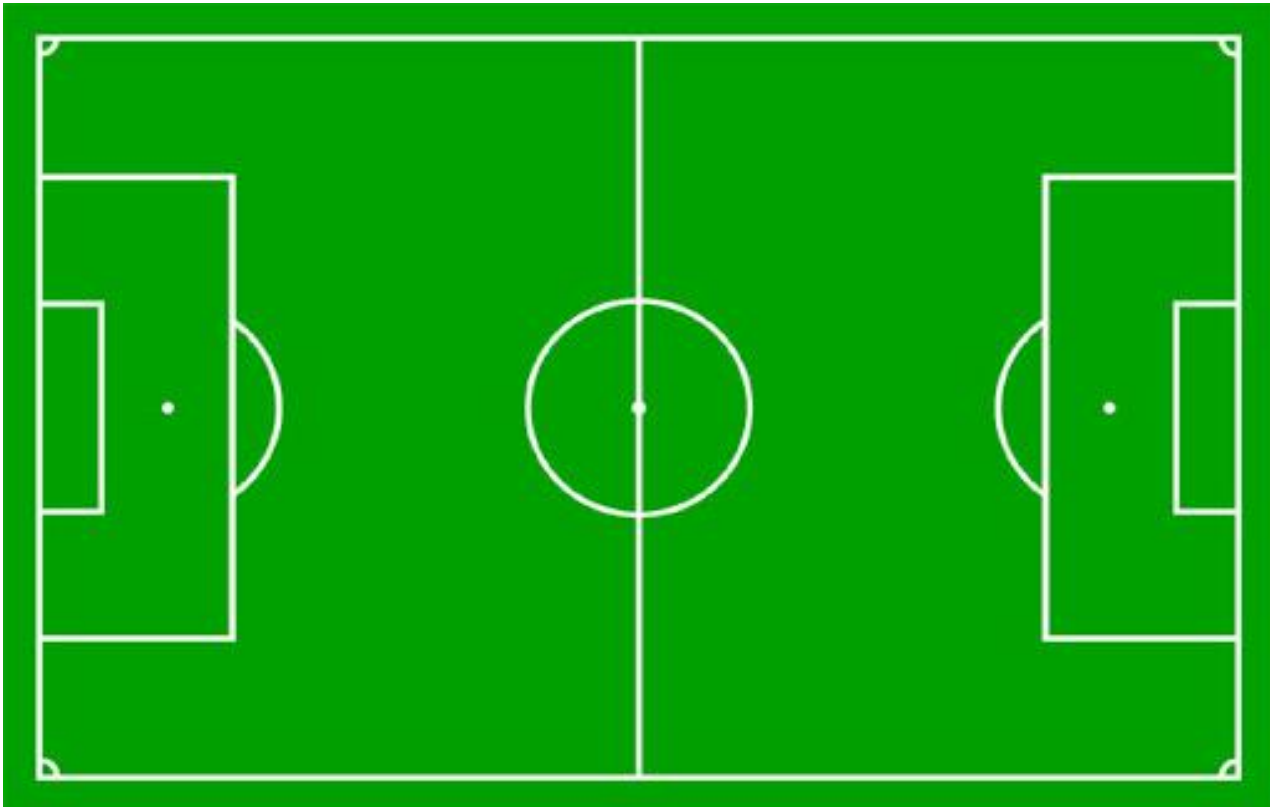
7) How many bags would each customer need to buy?

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Resources:

Soccer field markings diagram: 120m x 90m



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Building Consent Fees:

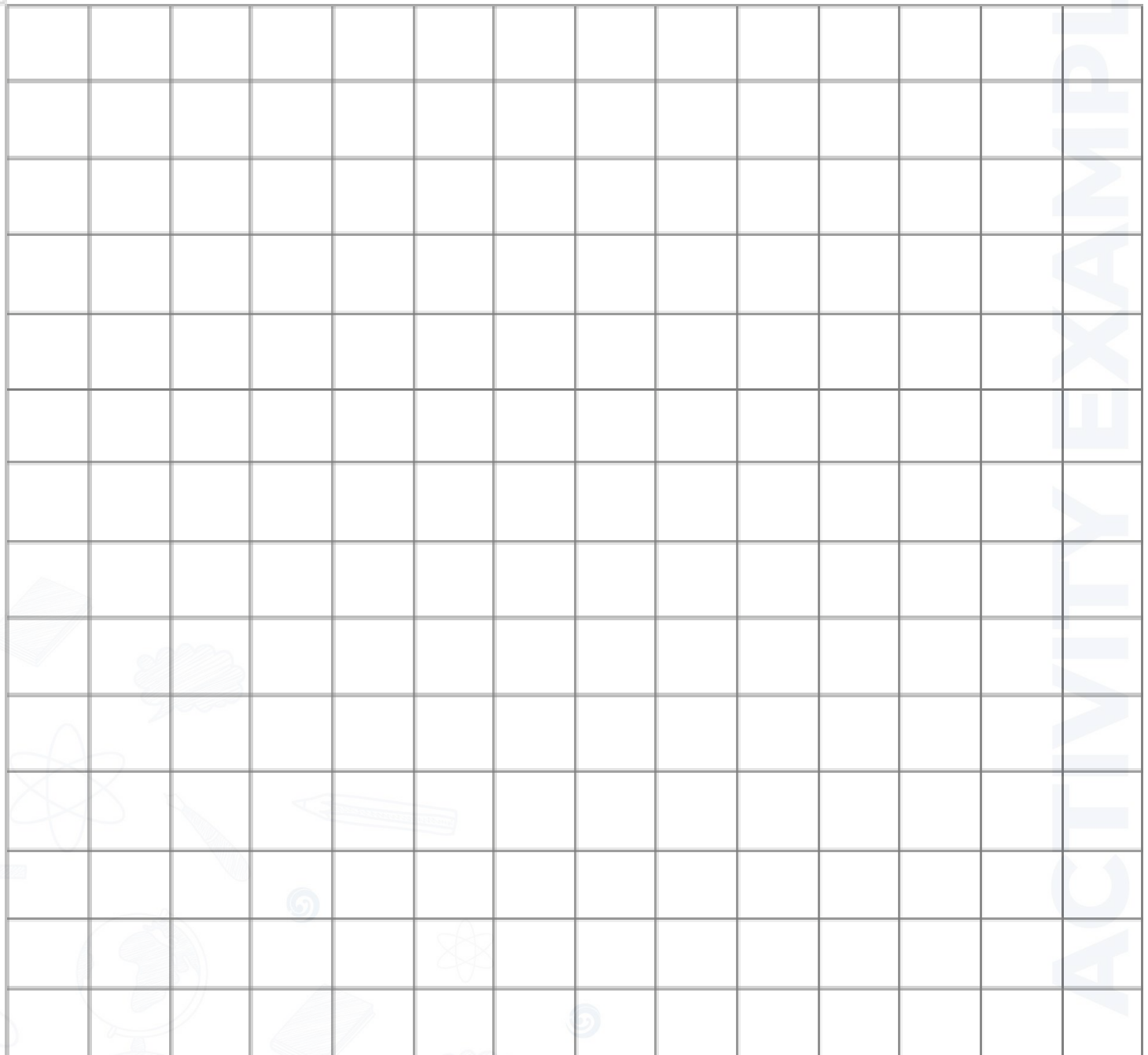
10	Dwelling single storey up to 100 m² (Category 1 level 2)	\$1980
11	Dwelling single storey up to 250 m² (Category 1 level 2)	\$2470
12	Dwelling single storey in excess of 250 m² (Category 1 level 2)	\$2580
13	Dwelling two storey or more up to 250 m² (Category 2)	\$3050
14	Dwelling two storey or more in excess of 250 m² (Category 2)	\$3840
15	Small commercial/industrial up to 300 m² (Category 1 level 2)	\$3300

- **Building Research Association Levy**
For every building consent with an estimated value of \$20,444 and over, \$1.00 per \$1,000 is payable.
(NB: GST is not applicable to this levy.)
- **Ministry of Business, Innovation and Employment Levy**
For every building consent with an estimated value of \$20,444 and over, \$2.01 per \$1,000 is payable.
- **Accreditation Levy of \$50.00 per building consent**

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Soccer field to scale:

1 square = 10m²



Answer Sheet:

Pohlen Park

(5) Mowing

The mowing area of Pohlen Park is 200m by 217m.

- viii) Calculate the total perimeter of the mowing area (m) **834m**
- ix) Calculate the area of grass for mowing (m²) **43,400m²**
- x) The mower is 4m wide and travels at a speed of 9km per hour. How long would it take to mow the area?
 $200 \times 217 = 43400$ (43.4km), $4 \times 9000 = 36000$ (36km), $43.4 / 36 = 1.205 = 1 \text{ hr } 12 \text{ m } 22 \text{ s}$

(6) Soccer fields

We need to repaint the lines and markings of the soccer field at Pohlen Park for the Winter season.

Width = 120m, Length = 90m

- (v) Using the table in the resource sheet (or your own grid paper), draw a soccer field to scale with these measurements.
- (vi) Calculate the area and perimeter of the soccer field. **Area = 10,800m², Perimeter = 420m**
- (vii) Using the diagram on the resource sheet, draw in the field markings (to scale) on your soccer field with the following instructions:
 - Half-way line
 - Centre spot
 - Centre circle radius = 9.15m
 - Penalty box = 16.m x 40.3m
 - Goal box = 5.5m x 18.3m
 - Penalty spot: 11m from goal line and in line with centre spot
 - Penalty arc radius = 9.15m from penalty spot
 - Corner arc radius = 1m

- (viii) Using your diagram and the details above, calculate the total length of all the markings (excluding centre spot and penalty spots).

Field perimeter + centre circle perimeter + half-way line length + penalty box perimeter + goal box perimeter + penalty arc + corner arcs

Field perimeter = 420m
Centre circle perimeter = 57.5m
Halfway line length = 90m
Penalty box perimeter = 112.6m (x2)
Goal box perimeter = 47.6m (x2)
Penalty arc = 4.3m (x2)
Corner arcs = 6.28m

Total length = 902.78m

- (x) One 750mL can of paint will paint a line that is 50m in length. How many cans of paint will you need to mark out the soccer field?
 $902.78 \text{ m} / 50 \text{ m} = 18.056$, 18 cans
- (xi) Calculate the total volume of paint needed to mark the soccer field (in litres).
 $18 \times 0.75 = 13.5$, 13.5 litres
- (xii) Each can of paint costs \$69.95. What will be the total cost of paint to mark the soccer field?
 $\$69.95 \times 18 = \$1,259.10$

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- (xiii) The average person walks at a speed of 1.4m per second (84m a minute). If you maintained this speed, how long would it take you to paint the soccer field?
 $902.78 / 1.4 = 644.84$, $644.84 / 60 = 10.74$, 10 minutes, 44 seconds

Building Consent Fees

(7) Building a new house

Using the example from the video, and the information on the resource sheet, calculate the building consent fees for a new house with the following specifications:

- ⇒ 2 storey dwelling
 - ⇒ 247m² area
 - ⇒ Estimated value of \$350,000
- xi) Cost of building consent fees: **\$3050**
- xii) BRANZ Levy fee: $\$Value \times (\$1 \div \$1000)$
 $\$350,000 \times (\$1 \div \$1000) = \350
- xiii) MBIE Levy fee: $\$Value \times (\$2.01 \div \$1000)$
 $\$350,000 \times (\$2.01 \div \$1000) = \703.50
- xiv) Total costs: $\$3050 + \$350 + \$703.50 = \$4,103.50$

(8) Calculate the building consent fees for a new house with the following specifications:

- ⇒ 1 storey dwelling
 - ⇒ 185m² area
 - ⇒ Estimated value of \$280,000
- v) Cost of building consent fees: **\$2470**
- vi) BRANZ Levy fee: $\$280,000 \times (\$1 \div \$1000) = \280
- vii) MBIE Levy fee: $\$280,000 \times (\$2.01 \div \$1000) = \562.80
- viii) Total costs: $\$2,470 + \$280 + \$562.80 = \$3,312.80$

Rubbish Bags

Costs to provide rubbish collection and run transfer stations = **\$2,000,000**
 Revenue from dump fees = **\$600,000**
 Income from general rates = **\$800,000**

- 8) How much does Council need to collect from the sale of rubbish bags? **\$600,000**
 Price per rubbish bag = **\$2.00**
 Price excluding GST = **\$1.70**
 Supermarket margin = **\$0.19**
 Number of rubbish collection customers = **9,800**
- 9) How much does Council make per bag excluding GST and the supermarket margin? **\$1.51**
- 10) To gain the required funding, how many bags need to be sold each year? **397,351**
- 11) How many bags would each customer need to buy? **40.5 (41)**

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If Council increased the price per bag to \$2.50,

- 12) How much would Council make per bag excluding GST and the supermarket margin? **\$1.90**
- 13) To gain required funding, how many bags need to be sold each year? **315,790**
- 14) How many bags would each customer need to buy? **32.2 (33)**