

Extension Activities

Homes and Buildings

Maths Extension Activities



Maths Extension Activities

The Maths extension activities can be used to consolidate or extend the skills taught as part of the project.

Some of the extension activities use data already collected as part of the project.

Some of the extension activities require new data to be collected.

ICT Opportunities

Some students may be able to devise their own survey sheets to support their investigative work.

Older students could devise their own database to support the surveys they undertake.

Step	Title	Notes
1	Coloured Windows. Window 2 panes, Window 3 panes, Window 4 panes	Worksheets to develop prediction of pattern, sequence and outcome.
2	Make a House 1, Make a House 2. Make a House 3.	Simple 2D shape recognition for younger students.
3	Brick Wall	Predict an outcome to a mathematical puzzle.

Resources	Vocabulary	Expectations
<p>Provided</p> <ul style="list-style-type: none"> • Coloured Windows • 2 Pane, 3 Pane, 4 Pane • Make a House • Worksheet 1, 2, 3 • Brick Wall <p>Suggested</p> <ul style="list-style-type: none"> • Coloured pencils • 2D shapes 	<p>pattern complete construct</p> <p>square circle circular</p> <p>rectangle rectangular triangle</p> <p>triangular</p> <p>downstairs upstairs front</p> <p>back</p> <p>window door draw</p> <p>write number</p>	<p>Most students will be able to</p> <ul style="list-style-type: none"> • Recognize simple patterns • Generalize and predict • Recognize 2D shapes • With help, follow instructions <p>Some students will be able to</p> <ul style="list-style-type: none"> • Solve mathematical problems or puzzles • Follow instructions independently

The focus of the activity is for the students to predict the number of outcomes in a patterning activity.

Objectives	Lesson Activities	Outcomes	Notes
<p>Students are able to predict how many different windows can be coloured using two colours.</p>	<ul style="list-style-type: none"> • Younger Students • Introduce task as a practical activity. • Show the students bricks in two colours. • Ask the students to suggest one way of making a pattern using two bricks. • Show the students the Coloured Windows worksheet Window 2 panes. • Ask the students to identify the first window on the picture. • Record the first suggested pattern. • Ask the students to suggest another way of making a pattern using two bricks. • Record the second suggested pattern. • Ask the students to see how many more different ways they can arrange the bricks. • Emphasise the need to make each arrangement different. 	<p>Students are able to state how many different ways there are of colouring a pair of window panes with only 2 colours available.</p>	<p>Use a photocopier to enlarge the Coloured Windows sheets.</p> <p>Younger students decide on the level of support needed for Window 3 panes, Window 4 panes.</p>
	<ul style="list-style-type: none"> • Older Students • Introduce the enlarged Coloured Windows Window 2 panes sheet • The students complete the worksheet. • Discuss with students how many different ways there are to complete the Window 2 panes. • Ask the students to predict how many ways there are to complete Window 3 panes. • The students complete the worksheet. • Ask the students if they can see any relationship between the results of Window 2 panes and Window 3 panes. • Note students may or may not be able to see the relationship at this stage. • Give the students Window 4 panes. • Students predict the result. • Students then tabulate the results. 	<p>Students recognize a relationship between the results of the tasks.</p> <p>Students tabulate the results.</p> <p>Students use tabulated results to predict outcomes using a window with any number of panes.</p>	<p>Students either produce their own table of results. Or students are provided with a table in which to record their results.</p> <p>The relationship between the results of Window 2 pane and Window 3 panes is that the number of ways has doubled.</p>

Activity 2

Make A House





The focus of the activity is for the students to be able to follow instructions and represent 2D shapes correctly.

Objectives	Lesson Activities	Outcomes	Notes
<p>Students follow instructions. Students use 2D shapes to complete a house picture.</p>	<ul style="list-style-type: none"> • Show the students examples of 2D shapes. • Ask the students to identify the shapes. • Use the keywords to enable students to recognize the words for the shapes. • Show the students the enlarged Make a House 1. • Read through the first instruction on the worksheet with the students. • Discuss the instruction to be followed. • Give the students the Make a House 1 worksheet. • The students complete the first instruction. • Repeat with each instruction until the worksheet is complete. 	<p>Students are able to follow instructions. Students are able to recognize the words for 2D shapes.</p> <p>Students are able to interpret discrete data.</p>	<p>Use the photocopier to enlarge one of the Make a House 1 worksheets. Use the others as follow on activities.</p> <p>Print shape keywords.</p>
	<ul style="list-style-type: none"> • Revise shape identification and word. • Give the students the Make a House 2. • Encourage the students to complete the worksheet independently. • Use the Make a House 3 as an assessment. 	<p>Students are able to use and interpret instructions.</p>	

The focus of the activity is for the students to devise a strategy to predict an outcome of a mathematical puzzle.

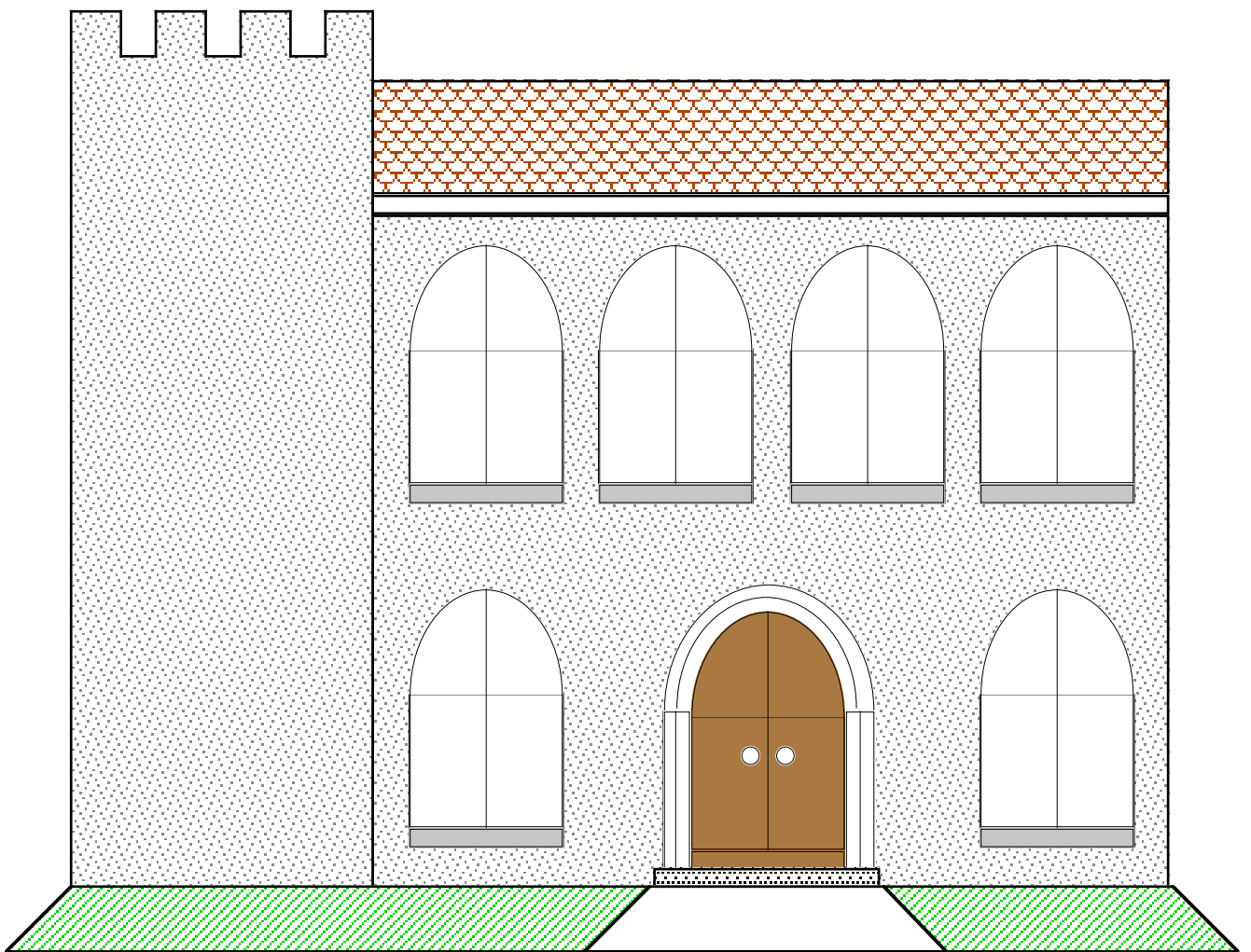
Objectives	Lesson Activities	Outcomes	Notes
<p>Students are able to generalize and predict patterns and relationships.</p>	<ul style="list-style-type: none"> • Introduce the activity using the enlarged Brick Wall worksheet. • Tell the students that they will only be using the numbers 1, 2, 3, 4, 5. • Ask a student to choose 3 of those numbers. • Ask the student to arrange the 3 chosen numbers in any order in the 3 bricks on the bottom row of the first wall. • Give the students a copy of the Brick Wall worksheet. • The students enter the chosen three numbers in the same order onto their worksheet. • Ask the students to add the two numbers in adjacent squares. • Write the answer in the brick space above. • Repeat adding the other two adjacent numbers on the bottom row of bricks. • Students record the answers on their worksheet. • Ask the students to read the two numbers on the middle row of bricks. • Ask the students to add these two numbers together. • Write the answer in the top brick. • Students record the answer on their worksheet. 	<p>Students are able to solve mathematical problems or puzzles with support.</p>	<p>Use a photocopier to enlarge the Brick Wall worksheet.</p> <p>Younger students decide on the level of support needed.</p>

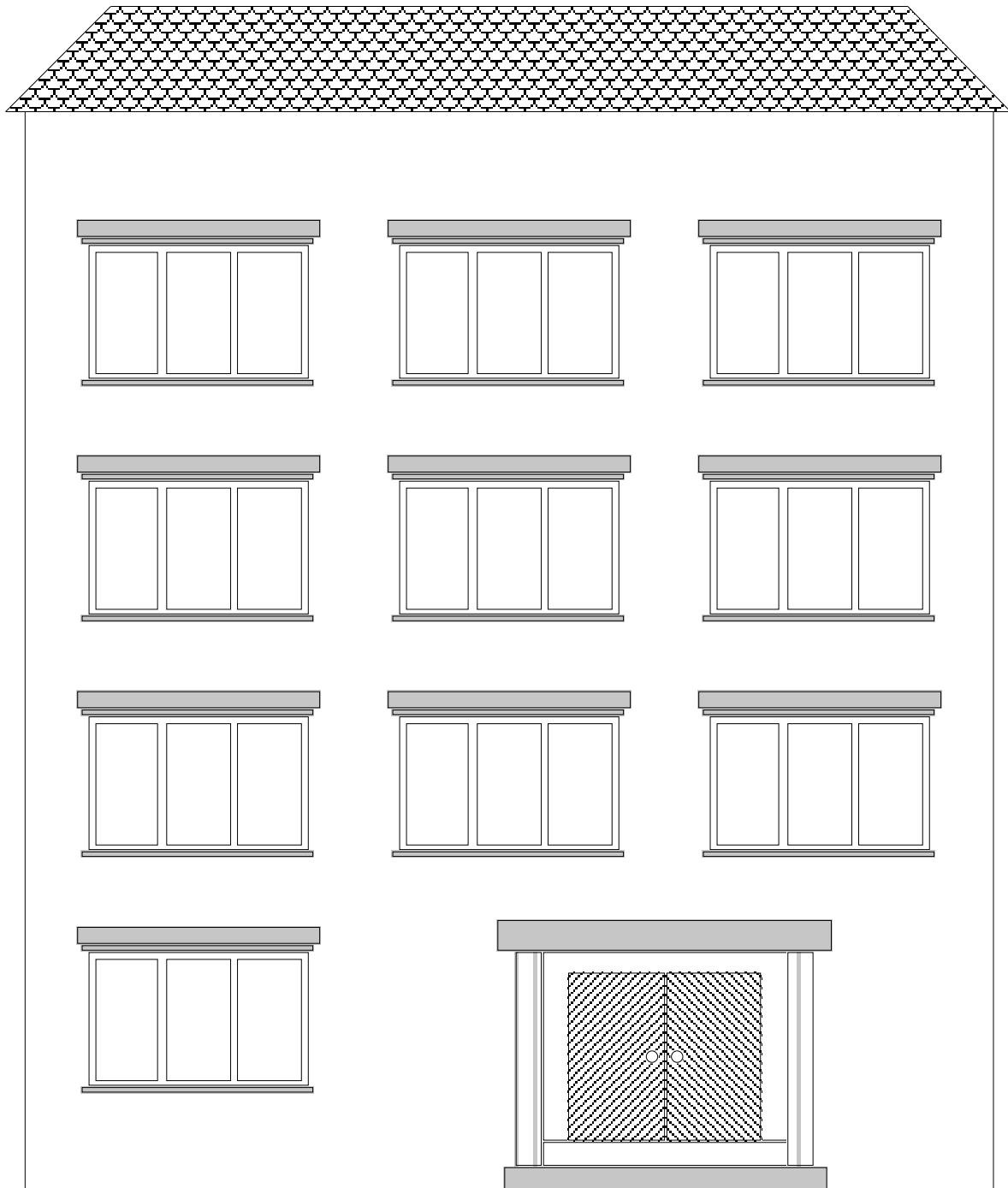
Extension Activity Resources

Week 1	Resource									
<p>Coloured Windows</p>	<p>Worksheets for students to predict the number of outcomes in a patterning activity.</p> <p>Give each student work sheet 1 which has 6 identical windows with 2 panes of glass. Ask the students to create as many different windows as possible using only 2 colours. For example:</p> <div style="display: flex; justify-content: space-around; align-items: center;"> <div style="text-align: center;">  <p>Blue Red</p> </div> <div style="text-align: center;">  <p>Red Blue</p> </div> <div style="text-align: center;">  <p>Red Red</p> </div> <div style="text-align: center;">  <p>Blue Blue</p> </div> </div> <p>Go on to worksheet 2 with 10 identical windows. Ask the students to create as many different windows as possible using only 2 colours.</p> <p>Finally using the same rules, try worksheet 3 with 20 identical windows.</p> <p>The following chart shows the number of possibilities :-</p> <table style="margin-left: 20px;"> <tr> <td>2 panes</td> <td>2 colours give 4 possibilities</td> <td>(2x2)</td> </tr> <tr> <td>3 panes</td> <td>2 colours give 8 possibilities</td> <td>(2x2x2)</td> </tr> <tr> <td>4 panes</td> <td>2 colours give 16 possibilities</td> <td>(2x2x2x2)</td> </tr> </table> <p>Encourage the students to predict the number of outcomes for these exercises.</p> <p><i>Extension Activity</i> Predict answers for windows with 5, 6 etc. panes.</p>	2 panes	2 colours give 4 possibilities	(2x2)	3 panes	2 colours give 8 possibilities	(2x2x2)	4 panes	2 colours give 16 possibilities	(2x2x2x2)
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4 panes	2 colours give 16 possibilities	(2x2x2x2)								
<p>Make a House</p>	<p>Worksheets for younger students to follow instructions then correctly represent 2D shapes.</p>									
Week 2	Resource									
<p>Brick Wall</p>	<p>Worksheet for the students to use to predict the outcome of a mathematical puzzle.</p>									

Name _____

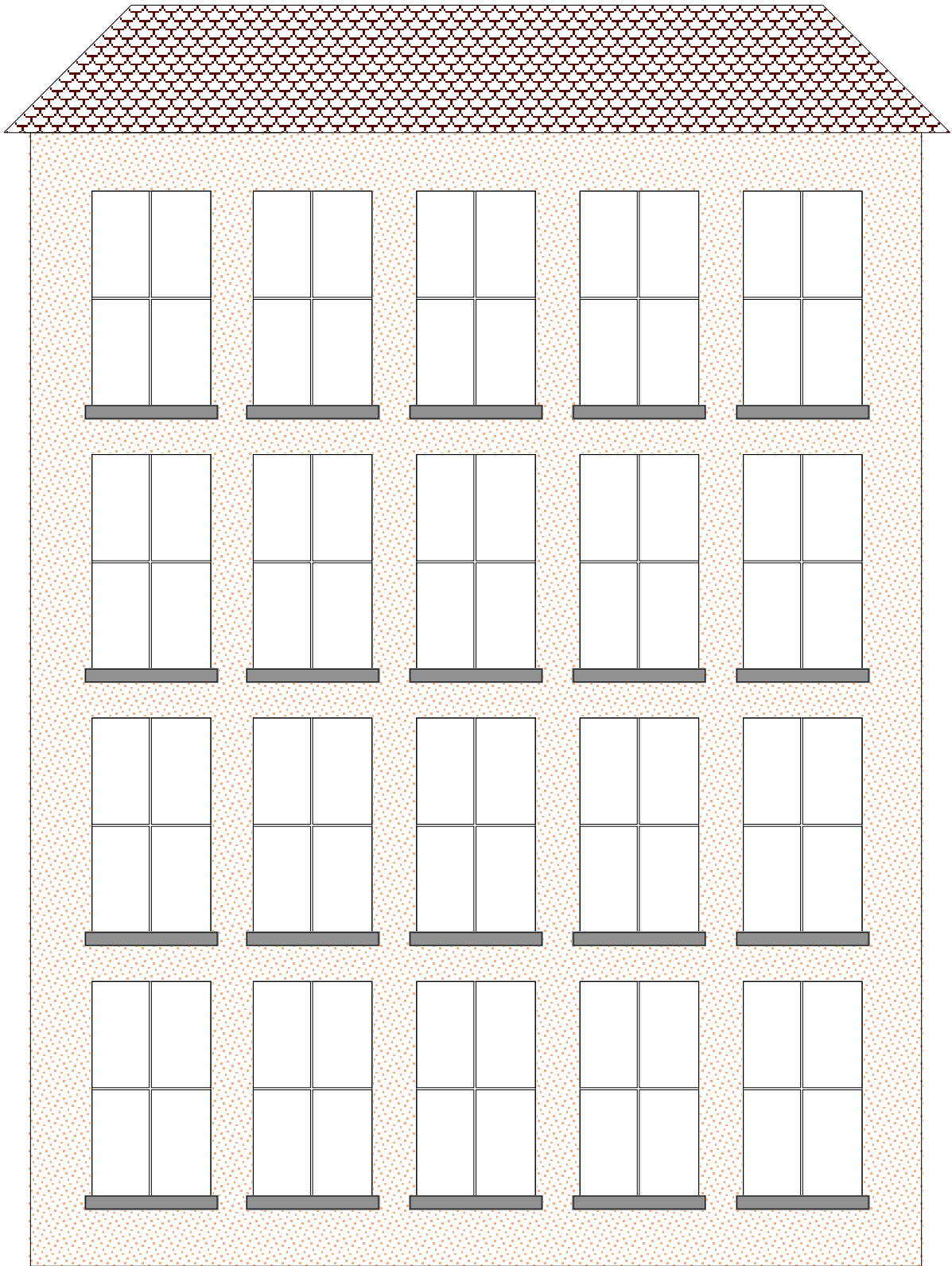
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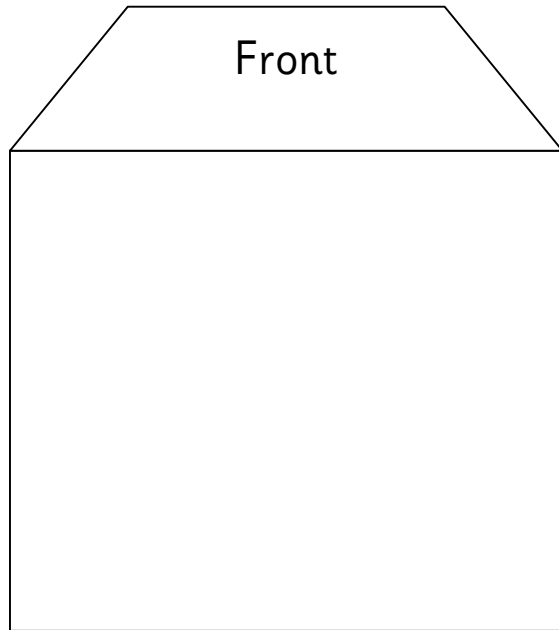


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Make a House

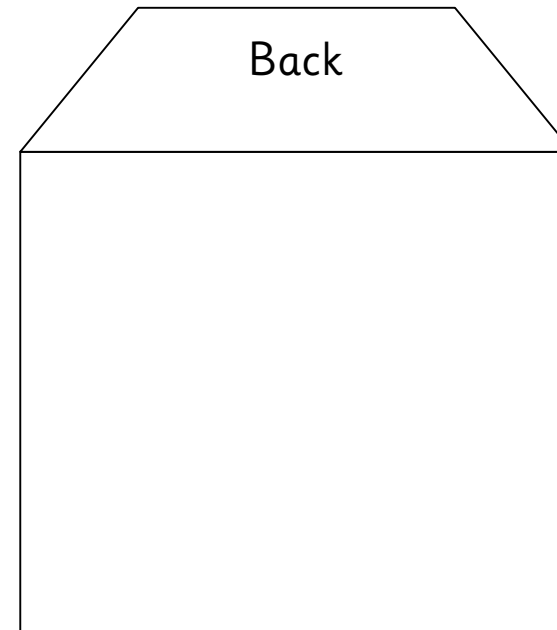


The front of the house.

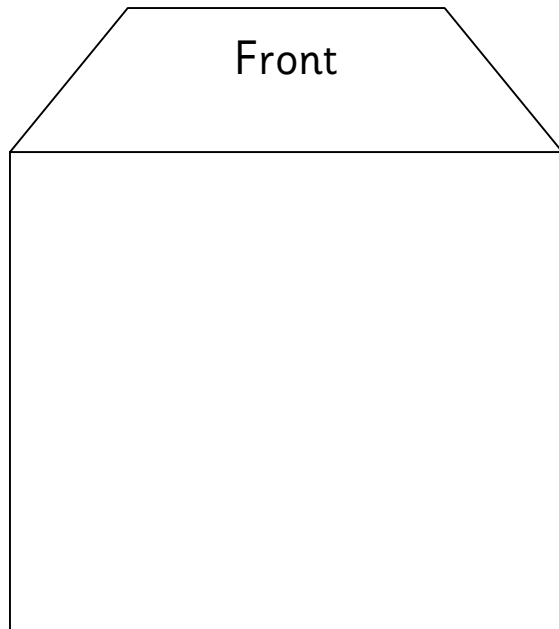
1. Draw 3 triangular windows upstairs.
2. Draw 2 square windows downstairs.
3. Draw 1 rectangular door.
4. Write number 26 on the door.

Now draw the back of the house.

1. Draw 2 circular windows upstairs.
2. Draw 1 rectangular window downstairs.
3. Draw 1 square window downstairs.
4. Draw 1 rectangular door.



Make a House

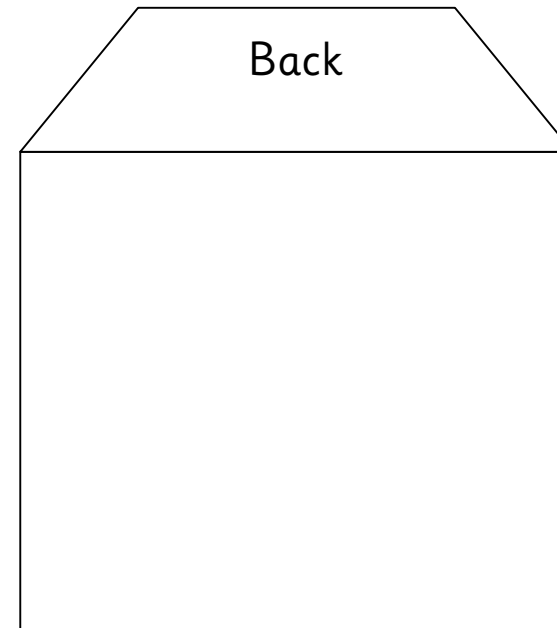


The front of the house.

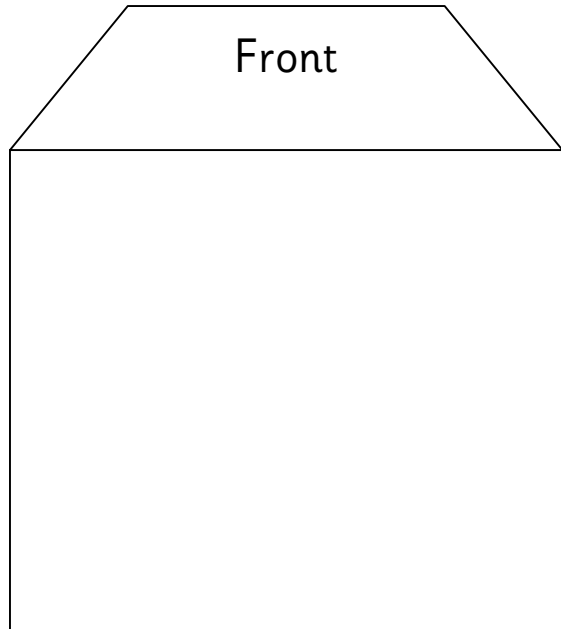
1. Draw 3 circular windows upstairs.
2. Draw 3 square windows downstairs.
3. Draw 1 rectangular door.
4. Write number 57 on the door.

Now draw the back of the house.

1. Draw 2 square windows upstairs.
2. Draw 1 triangular window downstairs.
3. Draw 1 circular window downstairs.
4. Draw 1 rectangular door.



Make a House

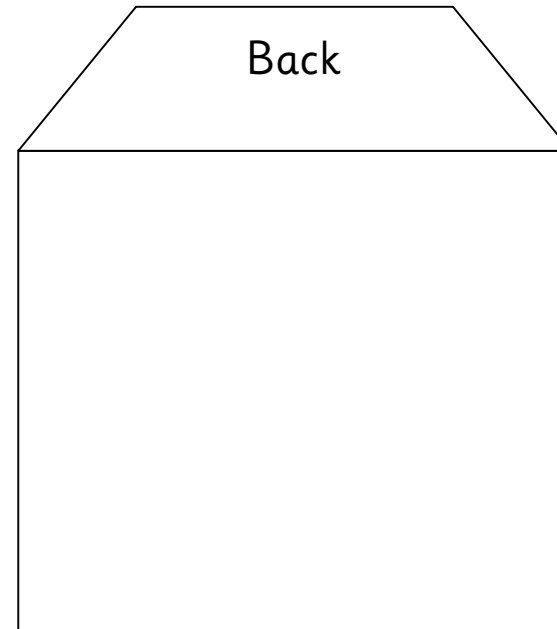


The front of the house.

1. Draw 3 square windows upstairs.
2. Draw 2 square windows downstairs.
3. Draw 1 rectangular door.
4. Write number 12 on the door.

Now draw the back of the house.

1. Draw 2 rectangular windows upstairs.
2. Draw 1 square window downstairs.
3. Draw 1 circular window downstairs.
4. Draw 1 rectangular door.



Name _____ Date _____

