

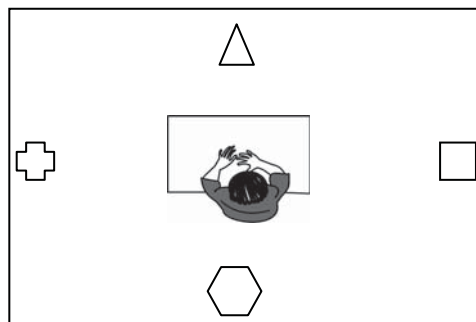
PROBLEM 35: ANGLES AND TURNS

Look at the following situations and work out what the descriptions mean. Use this understanding to give your own directions to the places specified below.

Degrees of turn:

Look at the picture below and the instructions given.

See if you can work out what 'quarter turn' and 'half turn' mean.



- Jemma sits in the middle and faces the triangle. She turns a **half-turn**. This means that she is facing the hexagon.
- Jemma faces the triangle. She turns a **quarter-turn clockwise**. This means that she is facing the square.
- Jemma faces the triangle. She turns a **quarter-turn anticlockwise**. This means that she is facing the cross.

1. What does a half-turn mean?

2. What does a quarter-turn mean?

3. Stand up behind your desk. Turn a half-turn. What are you facing?

4. Stand up behind your desk. Turn a quarter-turn clockwise. What are you facing?

5. Stand up behind your desk. Turn a quarter-turn anticlockwise. What are you facing?

6. Stand up behind your desk. Turn a half-turn, then a quarter-turn clockwise. What are you facing?

7. Stand up behind your desk. Turn a half-turn, then another half-turn. What are you facing?

Giving your own directions


Using what you have learned about turns, write some directions for a friend to follow:

Work out what they would be facing at the end but don't write it down.

Swap books with a friend and follow each other's directions to find out how well the directions worked. Write your answer on your friend's book and have them write their answer here:

Friend's name: _____

How well did the directions work? Explain your answer:

 **Understanding and manipulation:** Start facing where your directions ended. Reverse your directions so that you end up where you started. Write them here:

Teacher initials:

Date:

Problem solving / T&R:

- Problem solved with minimal or non-mathematical prompting
- Some leading questions were used to prompt thinking
- Solved after explanation
- Did not work out solution
- N/A- not a novel problem

Reasoning / Comm.:

(verbal, written, working and equations, or visual representations)

- Clearly and logically reasoned, clear directions
- Easily understood reasoning and directions
- Understood with some interpretation needed
- Some gaps or miscommunications
- Minimal or off topic

Understanding / Reflect:

- Connected manipulation problems to previous questions and answered easily
- Connected manipulation problems to previous questions with some prompting, and answered correctly
- Answered once the similarities to previous questions had been pointed out
- Had some problems in answers but was on the right track
- Did not answer appropriately
- Student not observed

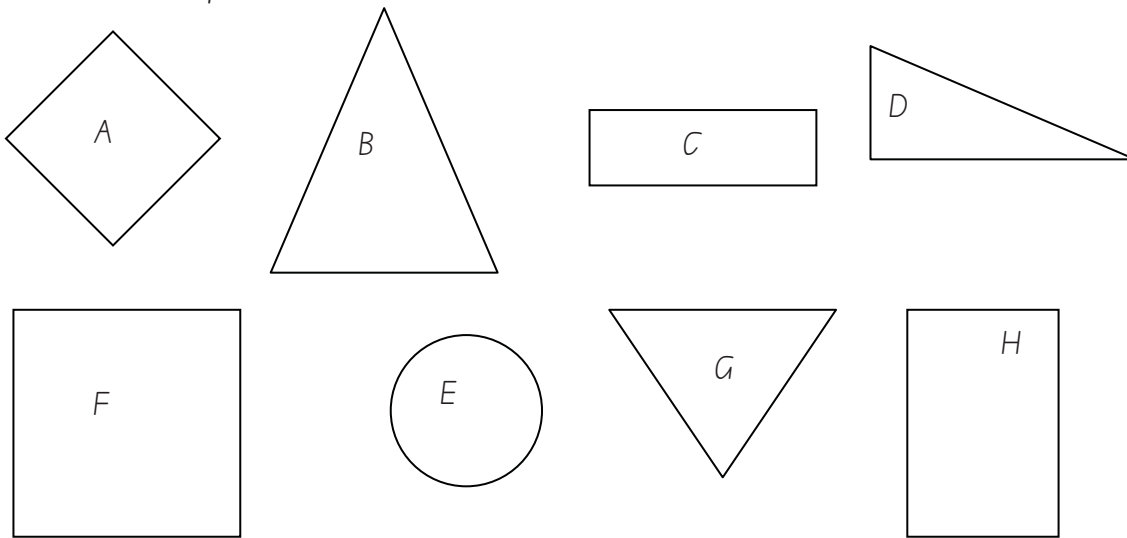
K1. Properties of 2D shapes

2D shapes are flat. They can be described in lots of different ways. In this activity you answer some questions about 2D shapes.

Questions you can ask about 2D shapes:

1. How many sides are there? Are they straight or curved?
2. Are the sides the same length as each other? How long are they?
3. How many corners are there?
4. What is the name of the shape?

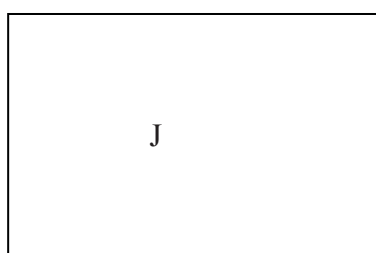
Look at the shapes below, work out the answers and write them in the table below:



Shape	How many sides? Straight?	Are the sides the same length? How long?	How many corners?	Name of the shape.
A				
B				
C				
D				
E				
F	4 straight sides	Same. 3cm long	4 corners	Square
G				
H				

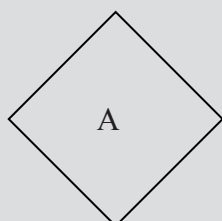
What is one way that I could group the shapes above? List the categories that you could use to group them, and draw the shapes that fit into each group. Remember to write the right letter on them.

Add these shapes into your categories:



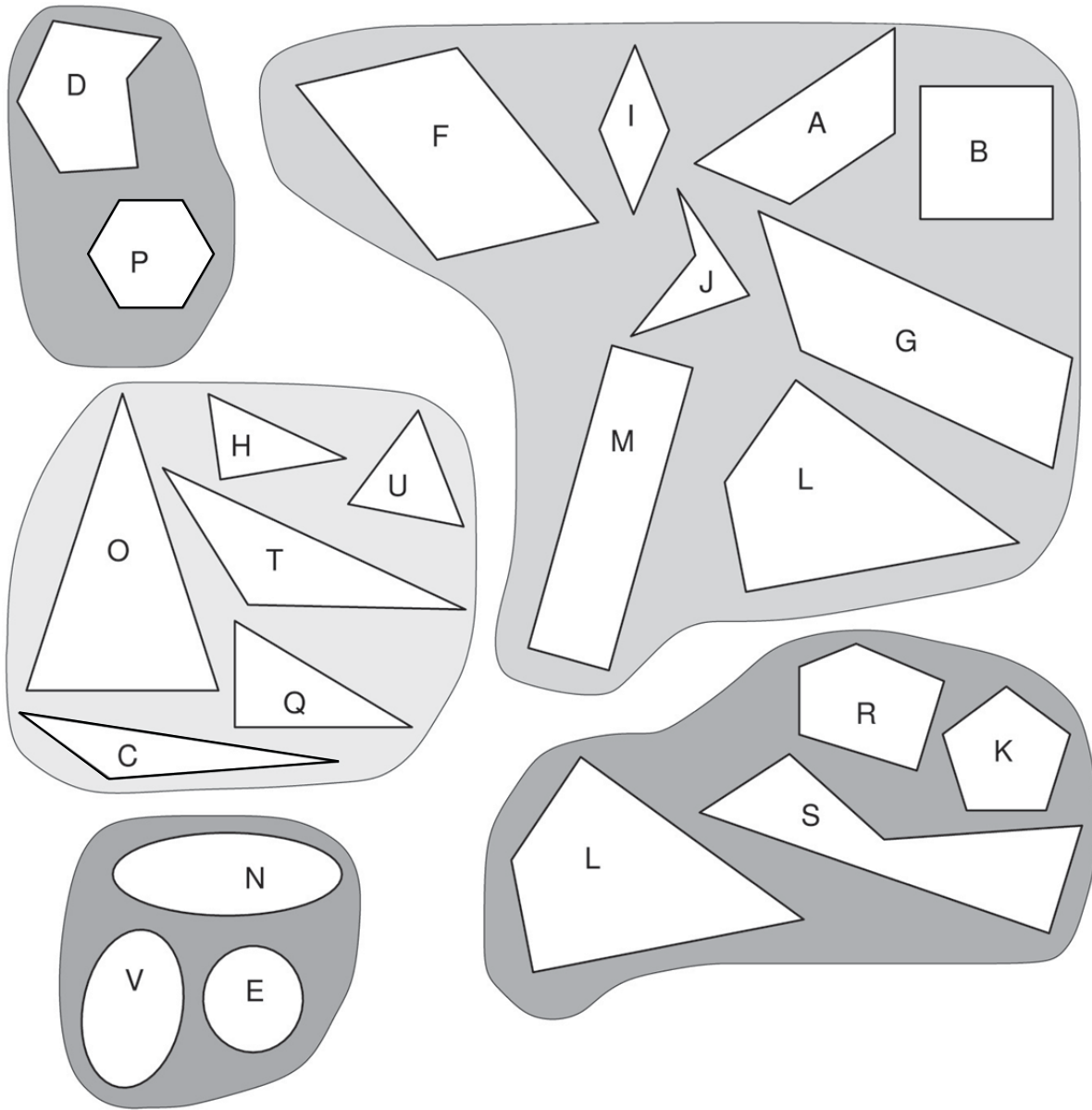
BACKWARDS QUESTION:

Shape A looks like a diamond. Try turning your book to see if you can find another shape that it looks like. What do you find?



K2. Shape families

How have these shapes been grouped into families?



How have the shapes been grouped into families? Did you find the shape in the wrong family?

How are the families similar? How are the families different?

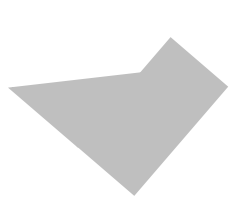
Interleaved practice

Number:

1. Starting at 120, count back in 5s until you get past 80.
2. $328 + \underline{\quad} = 502$
3. What groups can you make with 30 counters? Draw them as an array.
4. What number comes after 5 909?
5. Find two different ways to make \$6.50 without using any gold coins.

Measurement/Geometry:


6. Name three things that are longer than a metre. List them from shortest to longest.
7. What time will it be in one and a half hours?
8. Flip this shape across the line and draw what happens.



Chance/Data:

9. Choose 3 different types of toys that you have. Use tally marks to count up how many of each type you have.

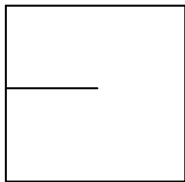
Create angles

 Angles relate to an amount of turn. In this activity you will make an angle machine, and use it to describe the amount of turn of the angles shown below.

Make your angle machine by cutting out the circle that your teacher is giving you and fitting it into the slotted paper. See below:

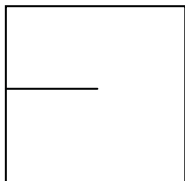


Look at the corner of your classroom. Make your angle machine show this angle. What does it look like?



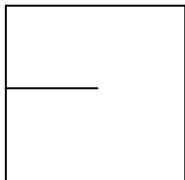
This angle is called a 'right' angle or a quarter-turn.

Open a book out flat. Make your angle machine show this angle. What does it look like?



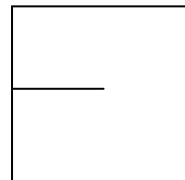
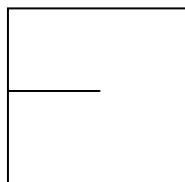
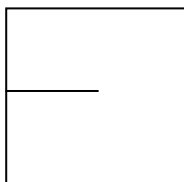
This angle is called a 'flat' angle or a half-turn.

Turn the minute hand of a clock from 12 all the way around to the 9 (clockwise of course!) Make your angle machine show this angle. What does it look like?

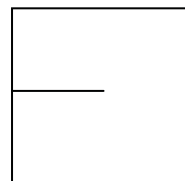
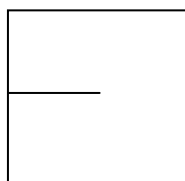
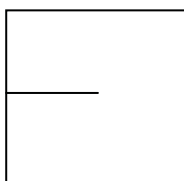


This angle is called a three quarter turn.

Angles smaller than a right angle are called acute angles. Make some here:

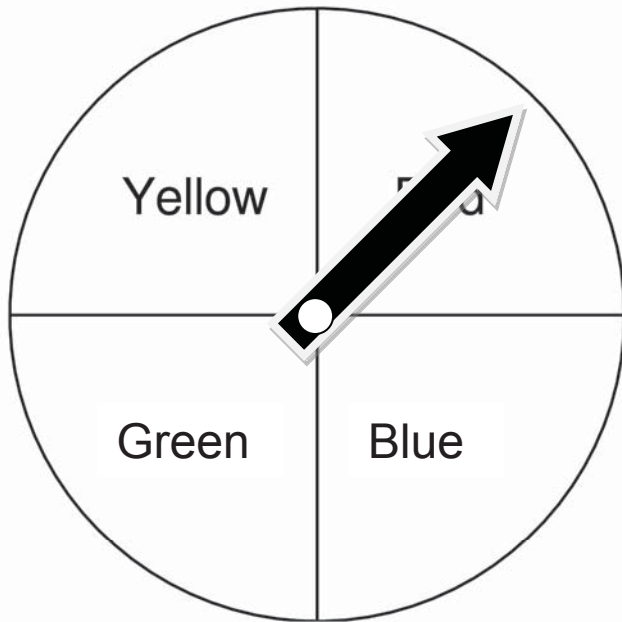


Angles that are between a right angle and a flat angle are called obtuse angles. Make some here:



☐ Look at the spinner below. A game is played where each player gets to spin the spinner. A point is scored by the player who's section the spinner lands in. Answer the questions and work out who won the game. Use a pointer for the spinner if needed.

The spinner is currently in the middle of the Red section.



THINKING QUESTION:

How could Elijah spin the spinner from its starting position so that he would score a point? List as many ways as you can think of.

Tally chart for recording the points:

Elijah	Yellow + Red	
Jane	Green + Blue	

What really happened:

Elijah went first. He spun the spinner a half-turn. What did it land on? Add the point to the table.

Jane went next. She spun the spinner a quarter-turn clockwise. What did it land on? Add the point to the table.

Elijah spun the spinner another quarter-turn clockwise. What did it land on? Add the point to the table.

Jane spun the spinner a whole turn and another half turn. What did it land on? Add the point to the table.

Elijah spun the spinner three quarter-turns anticlockwise. What did it land on? Add the point to the table.

Jane spun the spinner three quarter-turns clockwise. What did it land on? Add the point to the table.

Who won?