HUNTING FOR STARS

This worksheet will help you to find some mathematical patterns from the results of the "Hunting for Stars" activity. Follow the instructions below.

PART 1: "COLLECTING THE RESULTS"

Look at the results on your completed "Hunting for Stars" worksheet. Sometimes your patterns were stars, polygons or triangles etc. Use your results sheet to match the following circle pattern codes with the correct type of shape. Use the table below and circle each pattern code as you go.

6/1 6/2 6/3 6/4 6/5

7/1 7/2 7/3 7/4 7/5 7/6

8/1 8/2 8/3 8/4 8/5 8/6 8/7

9/1 9/2 9/3 9/4 9/5 9/6 9/7 9/8

10/1 10/2 10/3 10/4 10/5 10/6 10/7 10/8 10/9

12/1 12/2 12/3 12/4 12/5 12/6 12/7 12/8 12/9 12/10 12/11

PATTERN TYPE	PATTERN CODE (eg 8/1 is an "Octagon" pattern)							
Straight Line								
Triangle								
Square								
Pentagon								
Hexagon								
Heptagon								
Octagon	8/1							
Nonagon								
Decagon								
Dodecagon								
Star								
Star								
Star								

(NB: ONLY USE THE DARK BOXES FOR YOUR ANSWERS AND TRY TO PUT THEM IN ORDER AS

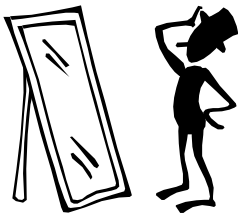
YOU GO)

PART 2: "LOOKING FOR PATTERNS"

Look carefully at the results that you have collected so far in the table.
There are some special rules for the results patterns. Use your results to help you answer the following questions.

Q1 Look at the "Straight Line" information. There is a simple connection between the first number and the second number in the pattern code. What is the rule here?

Q2 Before we look at other patterns, we need to think about SYMMETRY. (Your teacher may need to explain this and give some examples).

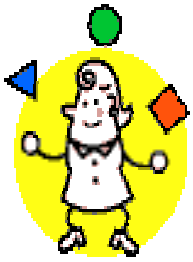


(a) Look at the patterns for 8/1 and 8/7. You should notice that these two patterns are exactly the same. Explain why this happens.

(b) Study the patterns for 10/2 and 10/8. What do you notice? Why does this happen?

(c) Without looking, you should be able say which pattern has to be the same as 12/3. Which pattern is it and why?

Q3 Now look at the "Triangle" information. What is the rule here that makes the pattern a triangle each time? Which answers are the same because of symmetry?

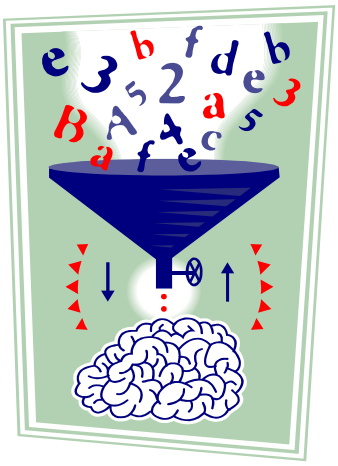


Q4 Now look at the "Square" information. What is the rule here that makes the pattern a square each time? Which answers are the same because of symmetry?

Q5 Now look at the "Stars" information. What is the rule that makes the pattern a star each time? List some of these star patterns that must be the same because of symmetry.

Q6 Finally, choose **one** other shape (this could be a pentagon, or a hexagon, or a heptagon, or an octagon, or a decagon, or a dodecagon!). Write down all the pattern codes for this shape and then write some sentences to explain why these codes work to make your pattern. Remember to include symmetry as well as your rule.

PART 3: "MAKING PREDICTIONS"



Use what you have learned so far to make some predictions.

Q7 The table on Page 1 still has a lot of empty spaces.
These are for other different pattern codes.
Your job is to fill the table using the correct codes.

The list below shows the missing pattern codes. Put these in the correct spaces in the table on Page 1. Circle each code as you go.

2/1	3/1	3/2	4/1	4/2	4/3	5/1
5/2	5/3	5/4	14/2	14/7	14/12	16/2
16/4	16/8	16/12	16/14	18/2	18/3	18/15
18/16	20/2	20/18	21/3	21/18	24/2	24/3
24/4	24/20	24/21	24/22			

PART 4: "EXTRA FOR EXPERTS"

A "Hunting for Stars" trophy is nearly yours! Here are some final questions to test how well you have understood this activity.

Q8 Predict the patterns using the following codes:

(a) 100/7 _____

(b) 25/5 _____

(c) 47/1 _____

(d) 24/4 _____

(e) 24/10 _____

Q9 For the following shapes, how many times would you go around the circle in constructing it? (a) 7/1 (b) 14/2 (c) 9/4 (d) 8/3

Q10 The table still has a few blank spaces. Choose three blank spaces and say what code could fit correctly in each space. Explain why for each one.

_____

_____

_____