Name _____

Review Group _____

SMARTIES PROJECT

Mark Scheme

This page shows you what your project will be checked against when it is marked. The following sections will be marked by both you and Mr Slack.

For Level 3 you should...	Pupil	Mr Slack
Show evidence of recording results with an order.		
Try different approaches and find ways of overcoming difficulties that arise when solving problems.		
Gather information.		
Extract and interpret information presented in simple tables.		
Use standard metric units of length (mm/cm/m/km)		

For Level 4 you should...

Present information and results in a clear and organised way.		
Collect and record discrete data.		
Find area by counting squares.		
Interpret numbers on measuring instruments (for example on a ruler).		
Solve problems with or without a calculator.		
Develop own strategy for solving problems.		

For Level 5 you should...

Identify and obtain necessary information to carry through a task and solve mathematical problems.		
Ask questions, plan how to answer them and collect the data required		
Use the formula for the area of a rectangle.		
Read and interpret scales on measuring instruments (for example on a ruler).		
Make sensible estimates of measures in everyday situations.		
Draw conclusions of their own and give an explanation of their reasoning.		
Use decimals in calculation		

For Level 6 you should...

Interpret information presented in a variety of mathematical forms.		
Calculate fractions of quantities (or performs × and/or ÷ on a fraction).		
Communicate interpretations and results of a statistical survey.		
Visualise 2D representations of 3D Objects		

What's in your box?

1. Estimate the total number of sweets in your box: _____
   Estimate how many of each colour you have in your box and fill in the table below.

Colour	Number	Fraction
Red		
Brown		
Yellow		
Green		
Orange		
Blue		
Pink		
Purple		
TOTALS		

2. Open your box of Smarties and <u>count</u> the number of each coloured sweet.
   Record the results in the table below.

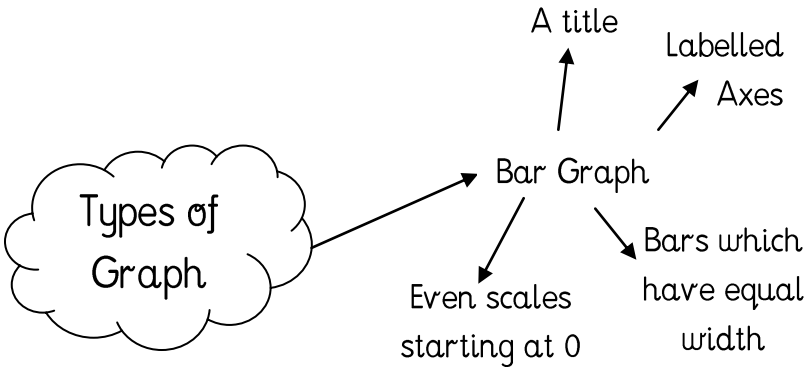
Colour	Tally	Frequency	Fraction
Red			
Brown			
Yellow			
Green			
Orange			
Blue			
Pink			
Purple			
TOTALS			

3. Compare your estimate to your actual results.
   In the space below, draw a table to compare your estimates and counted numbers.
   Add a column to show how close your estimates were.

4. In the space below, discuss the differences between your estimate and the number of each colour you counted from your box. Why do you think there might be more of some colours than others? What types of research could you do to check your theories?

Graphs of Smarties

1. Finish the splurge diagram to show all the different types of graph you know. Write down the things each type of graph needs to make it complete.
   The first example is started for you.



2. Draw a selection of graphs to show your collected data. There are lots of different things you could show on your graph. What are they?

Bonus Question: Calculate the percentages of each colour there is in your box. Can you turn this into any other form of number? Can this help us draw a special kind of graph?

Measuring SMARTIES

You must make sure you show all of your workings when calculating your answers.

1. Take these measurements of one of your Smarties.
   a. The length across (known as the Diameter) : _____

   b. The weight using a digital scale: _____
      The weight using an analogue balance: _____
      Which of the two do you think is the most accurate and why?

2. How many Smarties would fit across a length of 10cm?
   ...a length of one metre?
   ...a length of one kilometre?

3. How many Smarties would fit in an area of $1cm^2$?
   ...in an area of $10cm^2$?
   ...in an area of one metre squared?
   ...in an area of one square kilometre?

4. How many Smarties would cover the area of a football field?
   (A football field measures approximately 68m × 105m.)

Covering a Football Field

You will now be investigating how many boxes of Smarties it would take to cover a Football field in Smarties which are all the same colour. You must show all of your working.

It takes _____ Smarties (any colour) in total to cover a Football Field.

For each colour, you will need to fill in a sentence like the following:

I have <number> of <colour> Smarties in my box. Therefore I will need _____ boxes.

Record the number of boxes needed for each colour from some other people in the class in the table, Check they have calculated the number of boxes they need correctly.

Person asked	Red	Brown	Yellow	Green	Orange	Blue	Pink	Purple
1								
2								
3								
4								
5								
6								
7								
8								
9								
TOTALS								

Calculate the mean, median, mode and range for each colour for the people you asked.

	Red	Brown	Yellow	Green	Orange	Blue	Pink	Purple
Mean								
Median								
Mode								
Range								

Little box vs. BIG bag

1. Using the information you have collected from your little box of Smarties, estimate how many of each colour there will be in the big bag of Smarties.
   You may want to consider the mass of the box compared to the bag...

2. Put your results into this table:

	Est. using your little box		Est. using the class mean		Actual Bag
Colour	Count from Little Box	Estimate of Big Bag	Class Mean from boxes	Class Mean for Big Bag	Counting the Big Bag
Red					
Brown					
Yellow					
Green					
Orange					
Blue					
Pink					
Purple					
TOTALS					

3. Which has provided a more accurate prediction, your estimate from your box alone, or the mean of the whole class' estimates? Why do you think that is?

4. Draw a selection of graphs and charts to compare the number of Smarties in the little box compared to the big bag.

   Bonus: What else could you compare on a graph?

The Great Smarties Competition!

The new GIANT Packet of Smarties is to hold 1000 Smarties. The competition is to design and make a packet to hold this many Smarties. Remember to show how you decided on your dimension and show all designs you have considered.
You will need to consider the weight and size of the Smarties (which you worked out earlier in the project).

Draw your final, coloured and labelled (including sizes) design in the box below.

BONUS Task

Mr Slack wants to design his own brand of sweet based on Smarties. From the data you have collected over the past few lessons, what would you keep the same, what would you change? How would this affect the marketing and packaging?

Explain any decisions you make and explore alternatives.

Nutritional Information

This section will be your homework task for the duration of this project,

On the back of your Smarties box and all food packaging is a table which shows how much of the key food groups are in your food (for example sugars, fats, protein, fibre…).

In this short research project (expected to take you between 2 and 3 hours) you need to:

- Explain what this table on the back of food shows us and why it is important to know how much of these things is in our food.
- Include some general information (from research) about healthy eating.
- Compare your Smarties to other foods at home. How do the Smarties compare?
- How many boxes of Smarties do you think you could sensibly eat each day?

You will be marked on the following skills:

For Level 3 you should…	Pupil	Mr Slack
Show evidence of recording results with an order.		
Try different approaches and find ways of overcoming difficulties that arise when solving problems.		
Gather information.		
Extract and interpret information presented in simple tables.		

For Level 4 you should…

Present information and results in a clear and organised way.		
Collect and record discrete data.		

For Level 5 you should…

Identify and obtain necessary information to carry through a task and solve mathematical problems.		
Ask questions, plan how to answer them and collect the data required.		

For Level 6 you should…

Interpret information presented in a variety of mathematical forms.		
Design a survey to capture data from one or more sources, design, trial and refine data collection sheets.		
Communicate interpretations and results of a statistical survey.		

YEAR 7 SMARTIES PROJECT

Mr Slack