

Math Wizards



Grade 3 Data Management & Probability

Teacher's Notes

Ontario Mathematics Curriculum Grades 1 to 8, 1997
Strand: Data Management and Probability
Grade: 3

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Developed by T. Tasker

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Overall Expectations:

- sort, classify, and cross-classify objects and data
- collect and organize data
- interpret displays of data, present the information, and discuss it using mathematical language
- demonstrate an understanding of probability and demonstrate the ability to apply probability in familiar day-to-day situations
- relate meaningful experiences about probability

This resource is based on Data Management & Probability Friday's. That is, every Friday a break from the current mathematical unit is taken and Data Management & Probability is studied. Therefore there are 34 activities, one for almost every Friday of the year. This method can also help make the five mathematic strands more manageable.

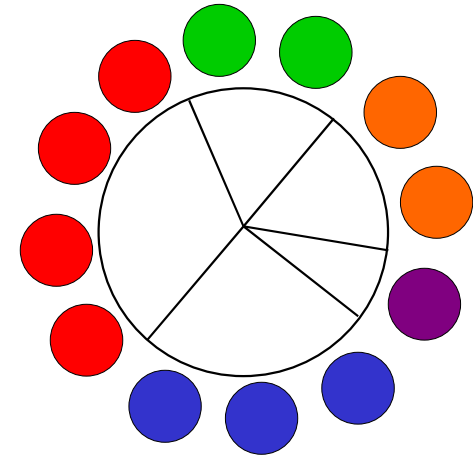
Resource Overview

Every class could warm up by turning the attendance graph into a human pie graph!

Directions for the human pie graph:

- 1) Have the students group themselves according to the category they chose in the attendance graph.
- 2) The groups then come to the carpet in a line.
- 3) The group lines join up to make a circle.
- 4) A large string can be laid around the inside perimeter of the circle.
- 5) A string can then be laid from the centre of the circle to where the various groups start and stop (see the diagram to the right).
- 6) Label the sections of the pie graph.
- 7) Discuss and interpret the pie graph.

** The daily attendance graph information can be found in the resource “Every day grade 3 mathematics” in the math room at www.bonfieldpublicschool.com.**



Graphing and Interpretation	Activity 1 Introduction Bar graph (1:1) of school supplies	Activity 2 Interpret bar graphs	Activity 3 Given data to bar graph (1:1)	Activity 4 Given data to bar graph (1:1)	Activity 5 Bar graph (1:10) of bugs	Activity 6 Bar graph (1:5) of leaves	Activity 7 Given data to bar graph (1: multiple)	Activity 8 Given data to bar graph (1:multiple)
	Activity 9 Interpret pictograph (1:10)	Activity 10 Magic pebbles pictograph (1:multiple)	Activity 11 Given data to pictograph (1:multiple)	Activity 12 Given data to pictograph (1:multiple)	Activity 13 Interpret pie or circle graphs	Activity 14 Class survey	Activity 15 School survey	Activity 15 (continued) School survey
	Activity 16 Interpret line graph							
Sorting & Classifying	Activity 17 Sorting buttons	Activity 18 Double Venn diagrams (buttons)	Activity 19 Double Venn diagrams (food)	Activity 20 Double Venn diagram (shapes)	Activity 21 Triple Venn diagram (snowmen)			
Probability	Activity 22 Probability with coin tossing	Activity 23 Probability with dice rolling	Activity 24 Leap Frog	Activity 25 Probability with spinners (half)	Activity 26 Probability with spinners (fair thirds)	Activity 27 Probability with spinners (unfair thirds)	Activity 28 Probability with spinners (fair quarters)	Activity 29 Probability with spinners (unfair quarters)
	Activity 30 Probability with spinners (unfair quarters)	Activity 31 Merlin's magical jar of insects	Activity 32 Merlin's magical jar of flowers	Activity 33 Merlin's Magic Bag (6:3:1)	Activity 34 Merlin's Magic Bag (4:4:2)			

Materials Box

The materials to implement this data management resource are easily and inexpensively made. Below is a list of those materials that you will need, organized by activity.

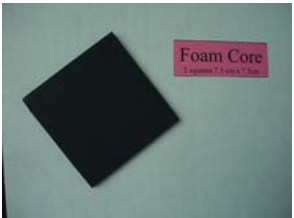
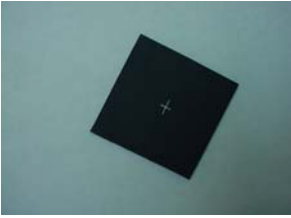
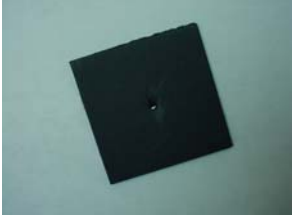
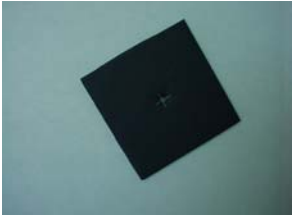
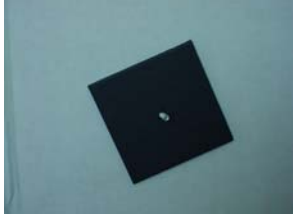

Activity FIVE	<p>- film canisters or cups</p> <p>** If you would like to use film canisters on your magnetic attendance graph board, just take a small magnet and tape it onto the bottom of the film canister. **</p>		
Activity SIX	<p>- film canisters or cups</p> <p>** If you would like to use film canisters on your magnetic attendance graph board, just take a small magnet and tape it onto the bottom of the film canister. **</p>		
Activity TEN	<p>- smarties in a small cup OR multi coloured lima beans in a small cup</p> <p>To make coloured lima beans:</p> <table border="1" style="width: 100%;"> <tr> <td style="width: 50%; vertical-align: top;"> <p>Materials</p> <p>1) white lima beans (these may be purchased at a grocery store)</p> <p>2) spray paint of various colours (red, yellow, blue, green, brown, etc.)</p> </td><td style="width: 50%; vertical-align: top;"> <p>Method:</p> <p>1) Lay the lima beans on a newspaper.</p> <p>2) Spray paint them and let them dry.</p> <p>3) Once dry, turn them over and spray paint the other side.</p> </td></tr> </table>	<p>Materials</p> <p>1) white lima beans (these may be purchased at a grocery store)</p> <p>2) spray paint of various colours (red, yellow, blue, green, brown, etc.)</p>	<p>Method:</p> <p>1) Lay the lima beans on a newspaper.</p> <p>2) Spray paint them and let them dry.</p> <p>3) Once dry, turn them over and spray paint the other side.</p>
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Activity FIFTEEN	<p>- a spread sheet software program like Appleworks, Quatro Pro or Excel.</p> <p>- if you have Excel you can download a ready to use spreadsheet at www.bonfieldpublicschool.com</p>		
Activity SEVENTEEN	<p>- buttons or beads for sorting (you may also choose another object)</p>		
Activity EIGHTEEN NINETEEN TWENTY TWENTY-ONE	<p>- sorting objects commercial or home made coloured pasta</p> <p>To make coloured pasta:</p> <table border="1" style="width: 100%;"> <tr> <td style="width: 50%; vertical-align: top;"> <p>Materials:</p> <p>1) different shaped pasta</p> <p>2) various colours of food colouring</p> <p>3) jar</p> <p>4) tin foil</p> </td><td style="width: 50%; vertical-align: top;"> <p>Method:</p> <p>1) Put the pasta and the food colouring into the jar.</p> <p>2) Close the jar lid tight and shake.</p> <p>3) Once colouring is evenly spread onto the pasta, spread out onto tin foil to dry.</p> </td></tr> </table>	<p>Materials:</p> <p>1) different shaped pasta</p> <p>2) various colours of food colouring</p> <p>3) jar</p> <p>4) tin foil</p>	<p>Method:</p> <p>1) Put the pasta and the food colouring into the jar.</p> <p>2) Close the jar lid tight and shake.</p> <p>3) Once colouring is evenly spread onto the pasta, spread out onto tin foil to dry.</p>
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Activity TWENTY-TWO	- a class set of real coins (pennies or nickles)
Activity TWENTY-THREE	- a class set of dice
Activity TWENTY-FOUR	- coloured lima beans (each pair of students requires 6 lima beans of two different colours - see directions in Activity TEN) - a class set of dice (each pair of students get two die)
Activity TWENTY-FIVE TWENTY-SIX TWENTY-SEVEN TWENTY-EIGHT TWENTY-NINE THIRTY	- commercial spinners OR CD spinners (building instruction follow this list of materials)
Activity THIRTY-ONE	- a jar with TEN objects inside. There should be three objects with a ratio of 5:3:1 (similar to Merlin's Magical Jar of Insects)
Activity THIRTY-TWO	- a jar with TEN objects inside. There should be three objects with a ratio of 5:2:2 (similar to Merlin's Magical Jar of Flowers)
Activity THIRTY-THREE	- a nice material bag with three different kinds of objects (example: erasers, pencils, markers) and have a ratio of 6:3:1 in the bag.
Activity THIRTY-FOUR	- a nice material bag with three different kinds of objects (example: erasers, pencils, markers) and have a ratio of 4:4:2 in the bag.

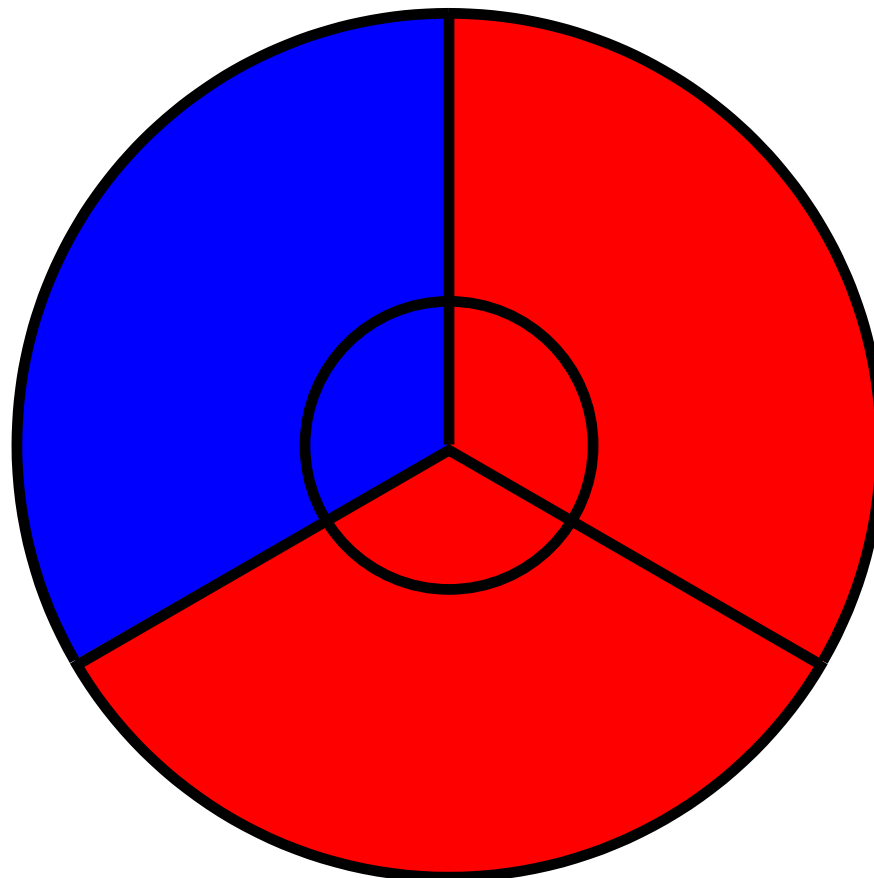
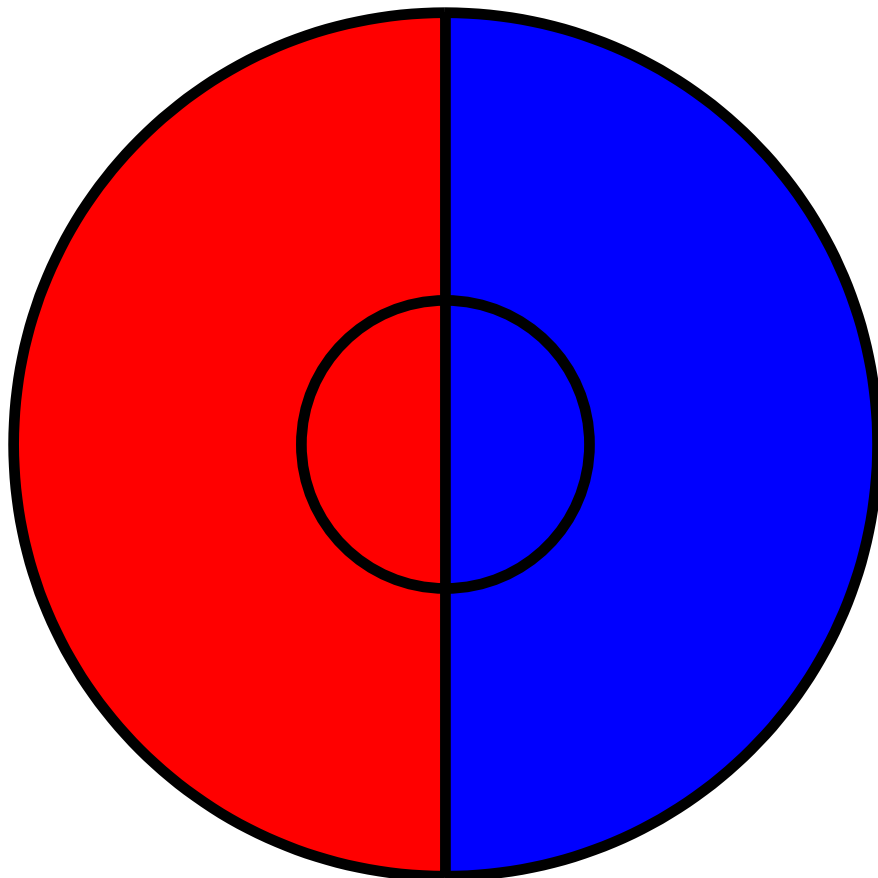
CD Spinner Instructions

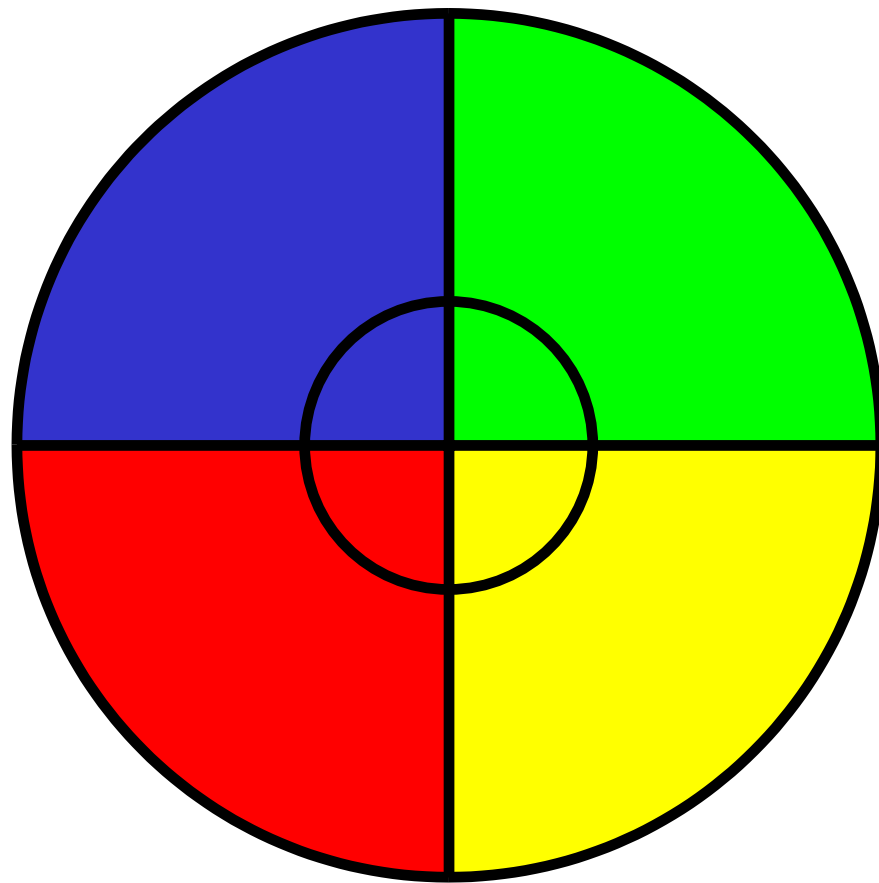
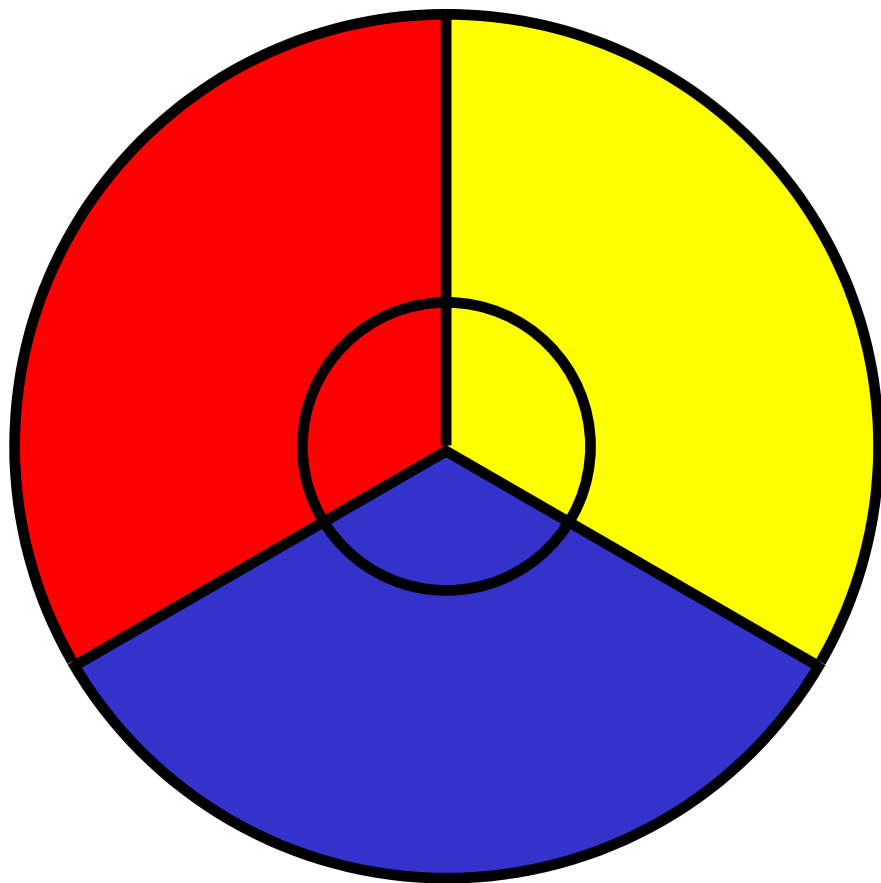
Materials:

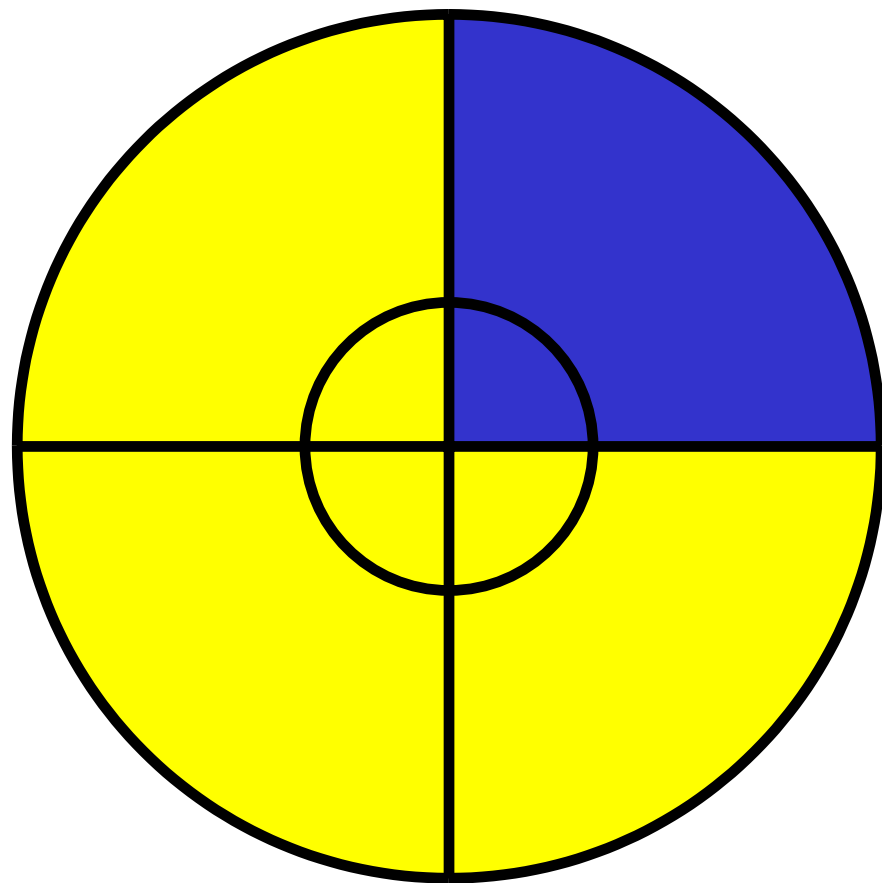
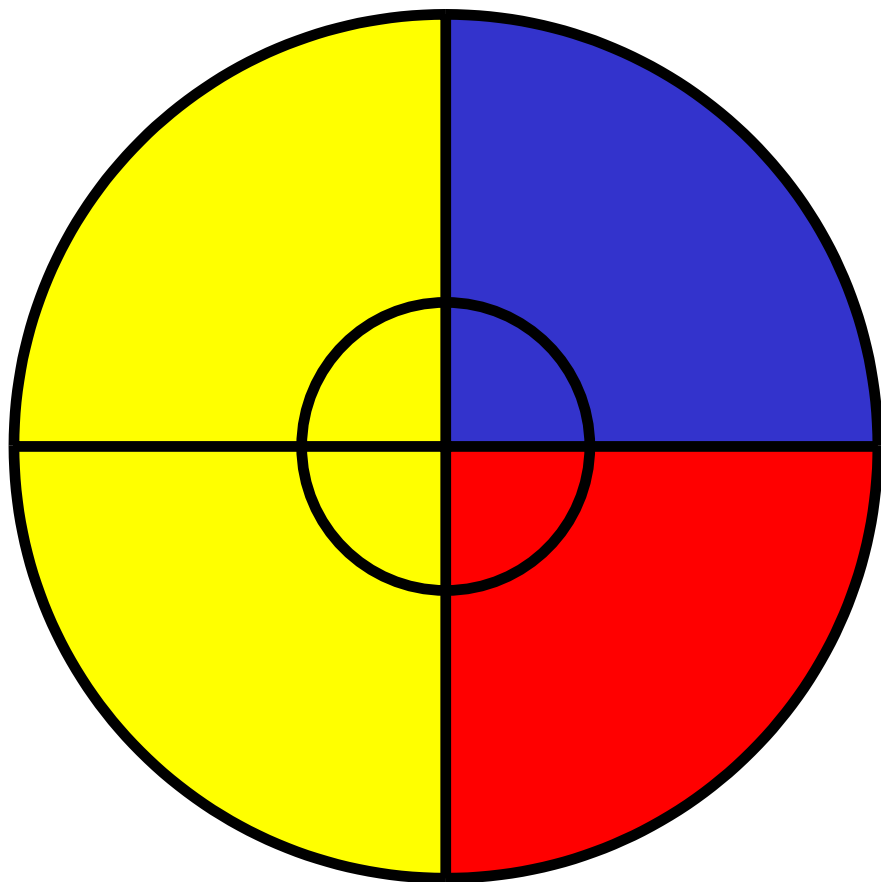
- 1) foam core board (available at stationary stores)
- 2) ruler
- 3) exacto knife
- 4) pencil
- 5) hammer
- 6) #8-32 x 3/4 bolt
- 7) glue
- 8) back up plate (washer)
- 9) #8-32 x 3/4 nut
- 10) an unwanted CD
- 11) velcro
- 12) full white sheet labels (example: Avery 08165 for inkjet printers)
- 13) Clear CD / DVD labels
- 14) cardboard
- 15) scissors
- 16) 4mm-.7 nut

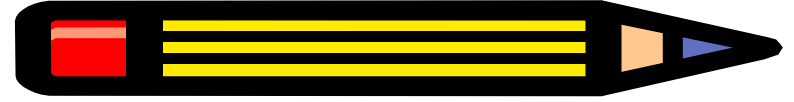
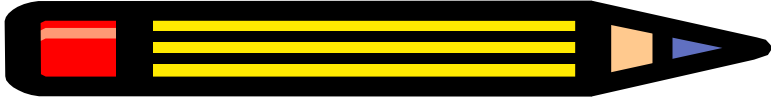
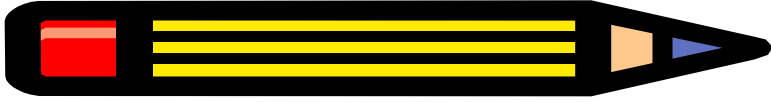
Directions	
1) Cut two 7.5cm x 7.5cm squares of foam core with an exacto knife.	
2) Mark the centre of one square on both sides, and on one side of the second square.	
3) Hammer the bottom of the bolt into the centre of ONE foam core square to form a hole in which the bolt may be inserted.	
4) Lightly hammer the head of the bolt into the SECOND foam core square so that it makes a small dimple.	
5) Insert the bolt through the FIRST foam core square (through the hole).	
6) Glue the dimple foam core square and place the dimple over the head of the bolt. This piece will help to keep the spinner flat.	

<p>7) Place one metal washer over the bolt and then screw on the medium hexagonal nut tightly.</p>	
<p>8) Print off the spinner templates that follow these directions onto the full white sheet labels (example: Avery 08165 for inkjet printers) OR decorate your own CD labels. You may choose to use the clear CD labels to place over top the decorated label for protection. (When printing the spinner templates select print current page or print pages x to y options)</p>	
<p>9) Attach one side of the velcro to the base and the other side to your CD. Remember while placing the velcro to keep things centred and that the velcro pieces match up. The bolt should come up through the hole in the CD.</p>	
<p>10) Place the second metal washer over the bolt. This will reduce the friction between the CD and the pointer.</p>	
<p>11) Print off the pointer templates that follow these directions onto the full white sheet labels (example: Avery 08165 for inkjet printers). Peel and stick the full label onto cardboard (cereal box guage is appropriate) and cut out the pointers. Punch a hole through the centre of the pointer. OR trace pointer onto cardboard and cut out. You may choose to decorate it in your own way.</p>	
<p>12) Place the pointer over the bolt and then screw on the small hexagonal nut just enough to prevent the pointer from flying off.</p>	











Data Management & Probability Activity ONE

As a class, let's make a list of where we see data.

Why do we communicate data in the form of graphs and charts?

Today we will be completing a bar graph on the next page. Remember to:

- identify the four parts of the graph; (*title, labels, scale, data*)
- create an appropriate title for the graph; and
- make sure all columns are properly labelled

When you have completed the graph, answer the following questions:

1) What does Merlin have most of? _____

2) What does Merlin need to buy? _____

3) How many pencils and erasers does Merlin have altogether? _____

4) What other information does this graph tell you?

Grade 3 DMactivity001 covers:

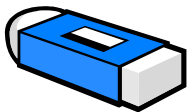



D7: construct bar graphs (with discrete classes on one axis and number on the other) and pictographs using scales with multiples of 2, 5 and 10

D8: interpret data from graphs (eg. bar graphs, pictographs, and circle graphs)

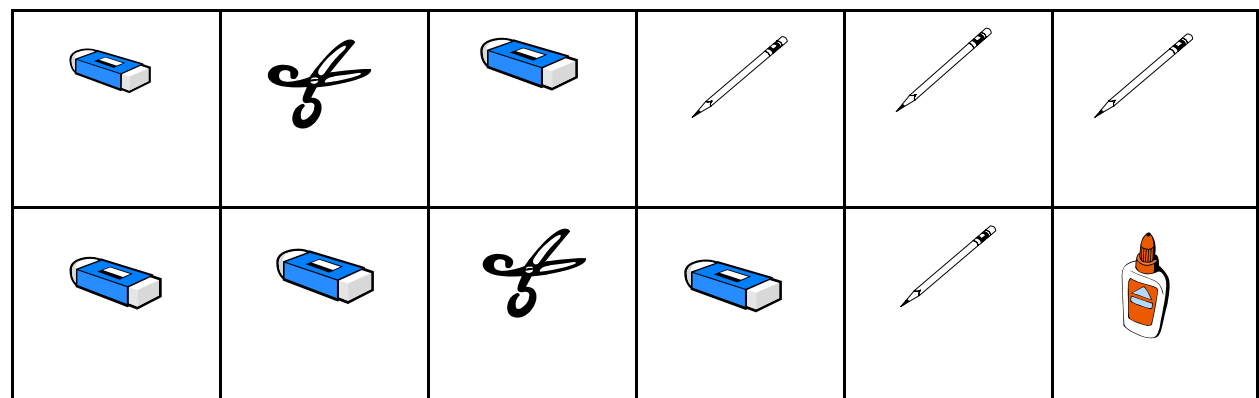
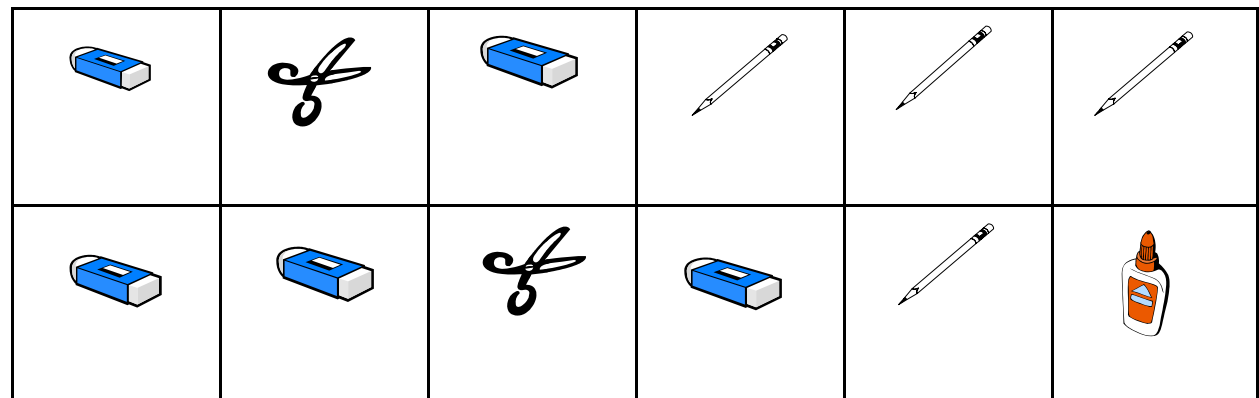
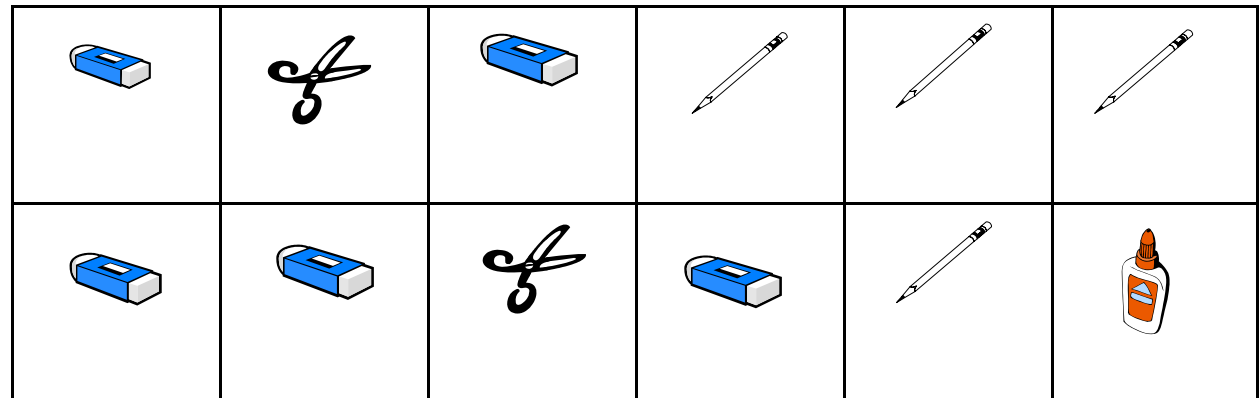
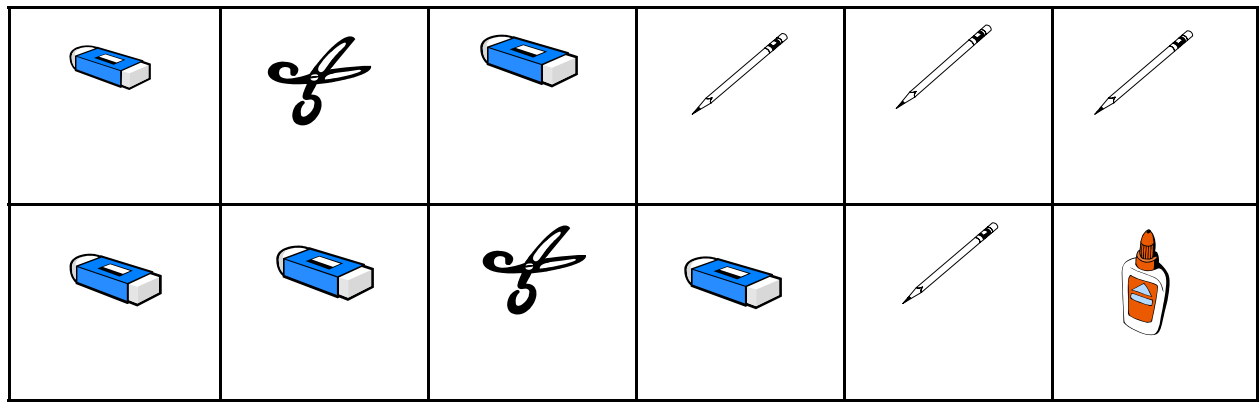
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Merlin is preparing to go back to school. He needs you to help him organize his school supplies. Would you show Merlin how to graph his school supplies so he can easily see what he has of each kind?



7				
6				
5				
4				
3				
2				
1				
	eraser 		scissors 	

**** Photocopy for students ****

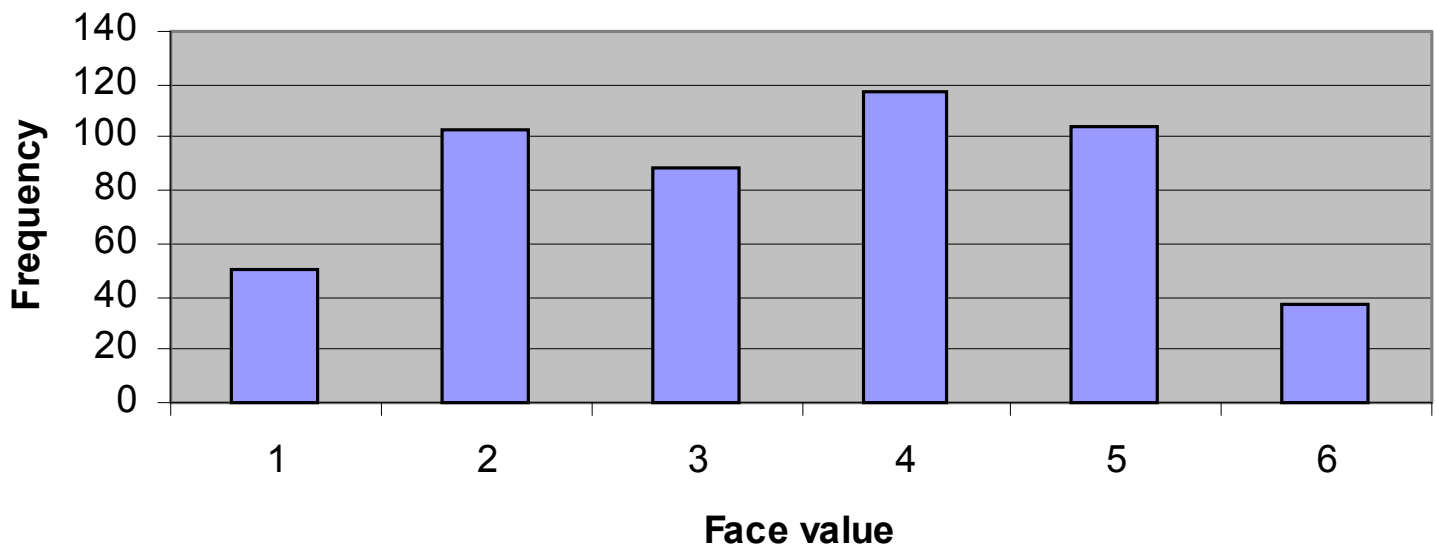




Data Management & Probability Activity TWO

With a partner, look at the following three bar graphs. In the space provided describe three things that the bar graph communicates.

500 rolls of one die



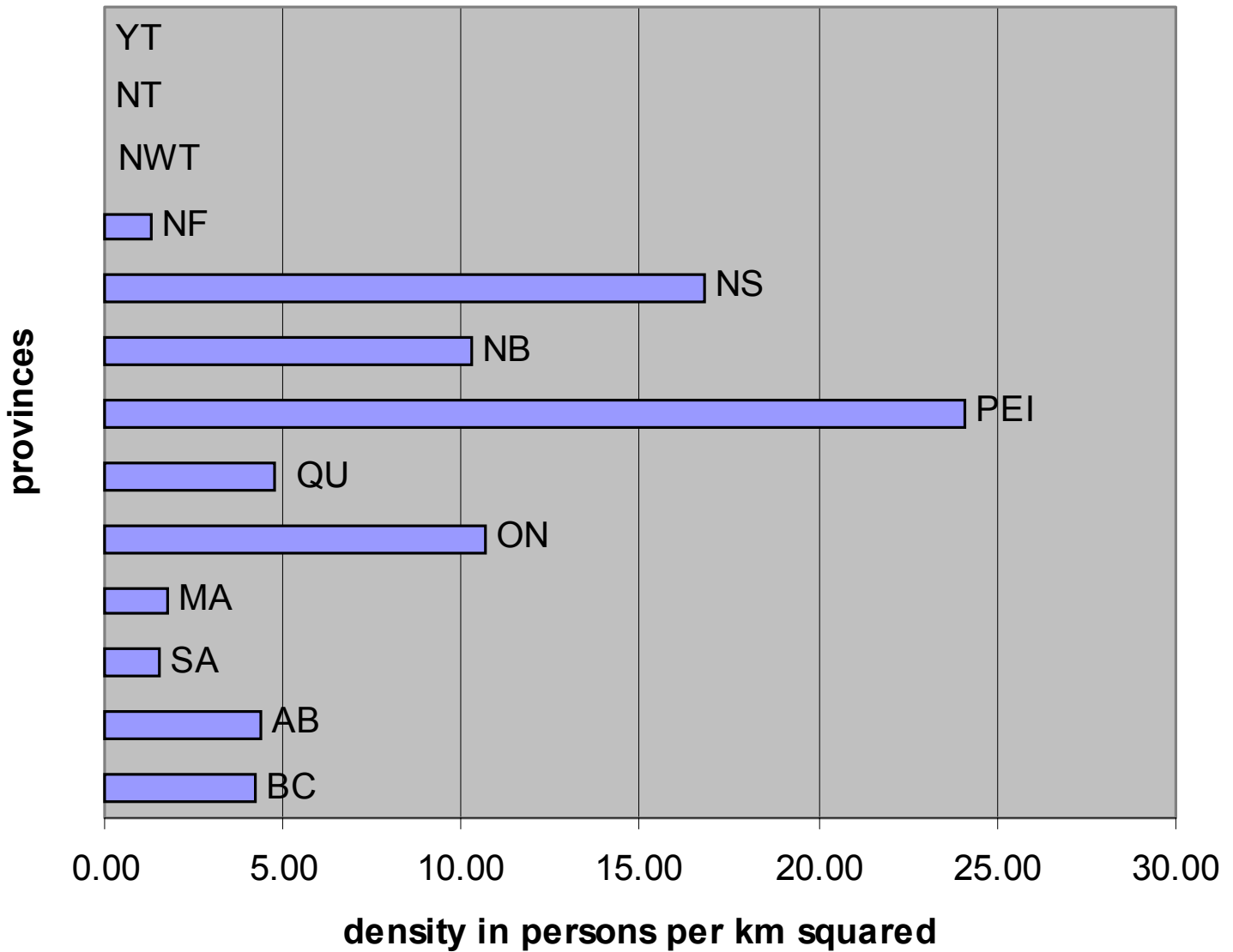
What does the graph “500 rolls of one die” communicate?

1) _____

2) _____

3) _____

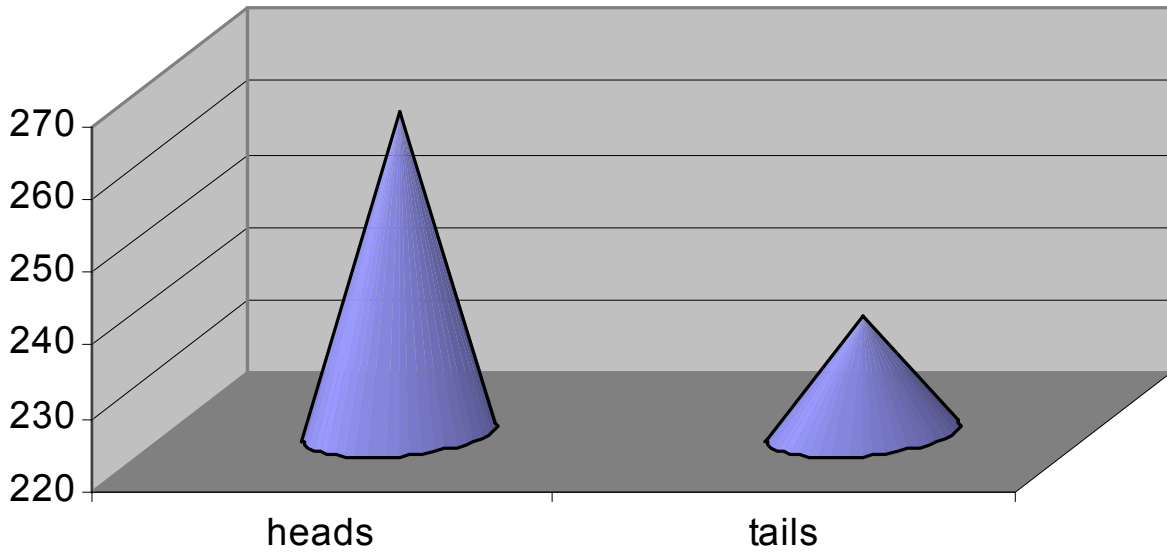
Provincial population densities



What does the graph “Provincial population densities” communicate?

- 1) _____
- 2) _____
- 3) _____

500 flips of one coin



What does the graph “500 flips of one coin” communicate?

- 1) _____
- 2) _____
- 3) _____

What are some similarities between the three different kinds of bar graphs?

What are some differences between the three different kinds of bar graphs?



Data Management & Probability Activity THREE

Merlin was given some flower bulbs as a gift. Flower bulbs are planted in the fall, stay dormant for the winter and then bloom in the spring! But of course Merlin turned his gardening into mathematics. Let's graph Merlin's flower bulbs.

Tulips	Daffodils	Crocuses	Hyacinths

Scale												

What does Merlin have most of?

What does Merlin have least of?

How many tulips and crocuses does Merlin have altogether?

What else does the graph tell you?

Grade 3 DMactivity003 covers:

D7:construct bar graphs (with discrete classes on one axis and number on the other) and pictographs using scales with multiples of 2, 5, and 10

D8:interpret data from graphs(eg. bar graphs, pictographs, and circle graphs)

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Data Management & Probability

Activity FOUR

Merlin loves fall leaves. He decided to collect some of the fallen leaves for a collage art project. Let's graph how many of each colour Merlin collected.

Red	Yellow	Green	Brown
4	7	3	9

Scale												

What colour does Merlin have the most of?

What does colour does Merlin have the least of?

How many red and green leaves does Merlin have altogether?

What else does the graph tell you?

Grade 3 DMactivity004 covers:

D7:construct bar graphs (with discrete classes on one axis and number on the other) and pictographs using scales with multiples of 2, 5, and 10

D8:interpret data from graphs(eg. bar graphs, pictographs, and circle graphs)

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Data Management & Probability

Activity FIVE

**** Cut out all the bugs on the black line master following this activity. At the carpet, demonstrate how large the graph will be using all of the bugs and talk about the disadvantages of having a big graph. Then ask students to place 10 bugs each into film canisters (or zip loc bags or cups). Now, graph the film canisters. As a class ,discuss how and why the scale changed.****

At the carpet, we graphed bugs. How did the scale change?

Why did the scale change?

Let's complete the bar graph on the next page. After you've finished, answer the following questions:

1) What kind of bug does Merlin have the most of? _____

2) What kind of bug does Merlin have the least of? _____

3) How many worms and ants does Merlin have altogether? _____

Grade 3 DMactivity005 covers:

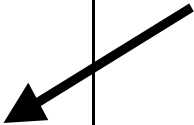
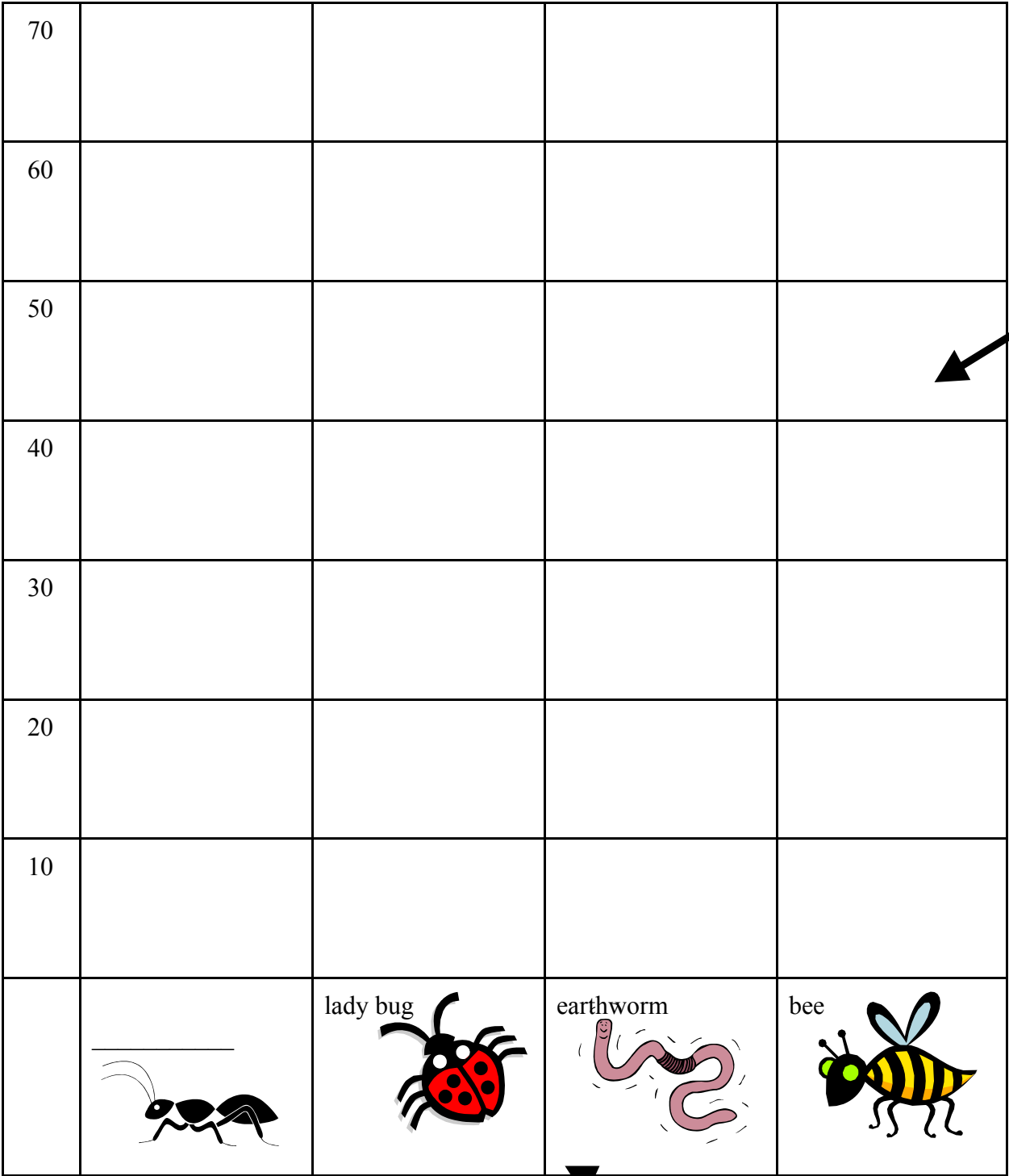
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D8: interpret data from graphs (eg. bar graphs, pictographs, and circle graphs)

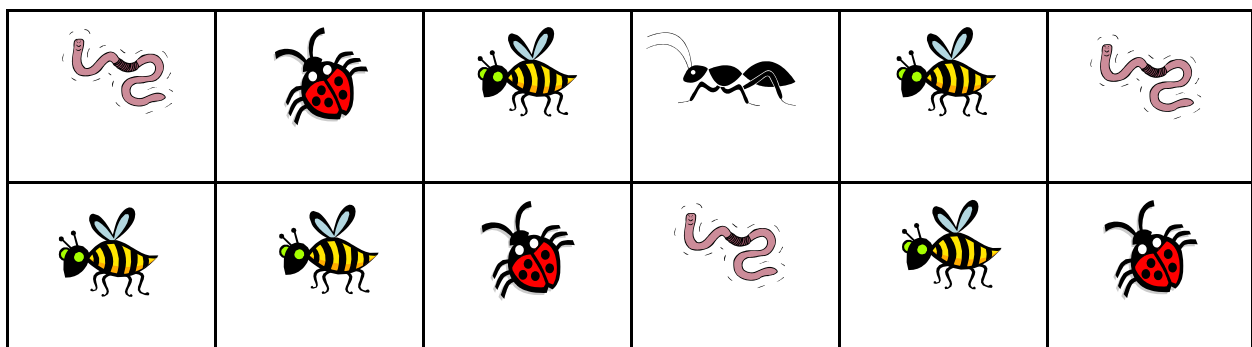
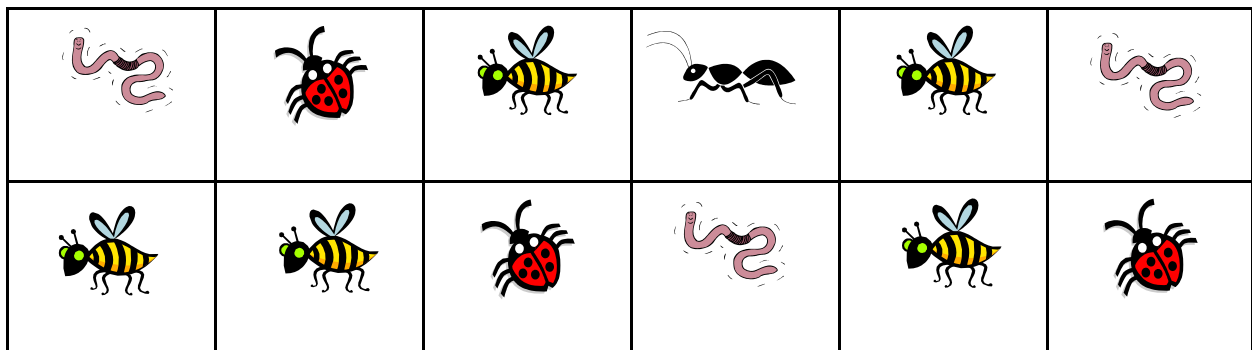
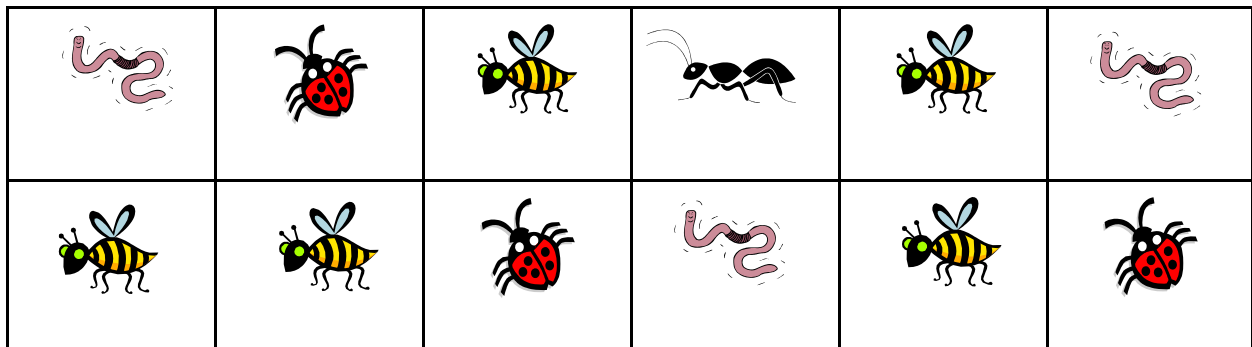
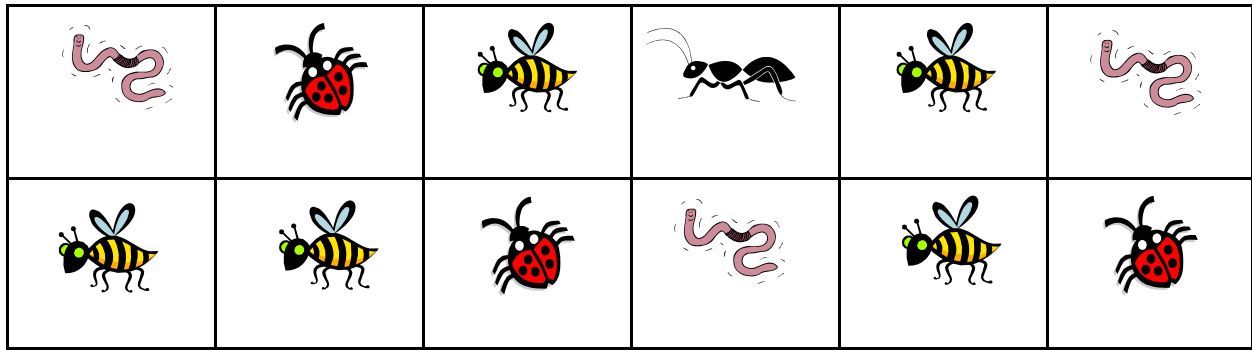
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Merlin has noticed a lot of bugs in his garden. He needs you to help him sort through the different kinds of bugs in his garden. Would you show Merlin how to graph the bugs so he can easily see how many he has of each kind?

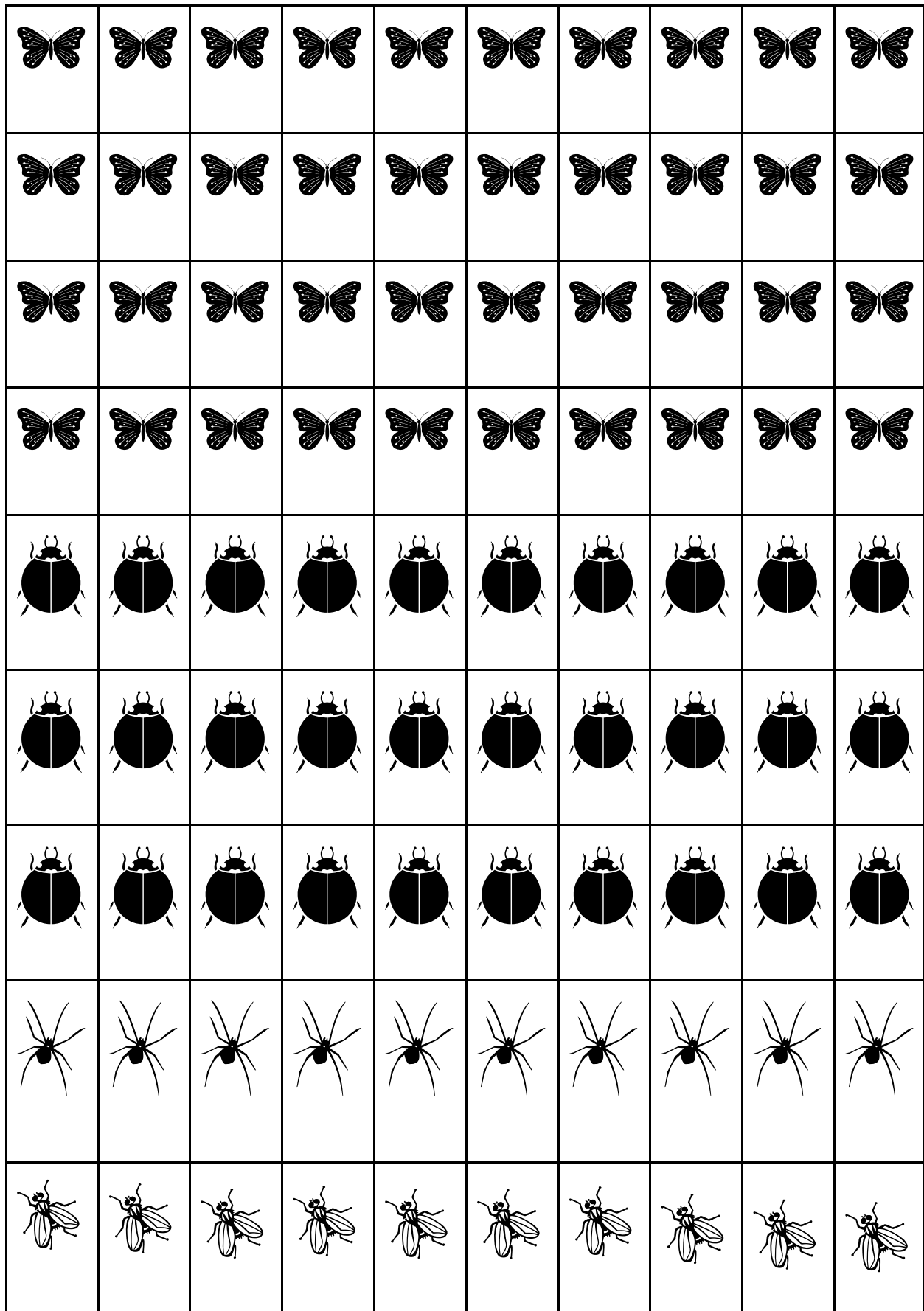




**** Photocopy for students****



**** Photocopy and cut out for the grouping activity at the carpet.****



Data Management and Probability

Activity SIX



**** Cut out all the leaves on the black line master following this activity. At the carpet, demonstrate how large the graph will be using all of the leaves and talk about the disadvantages of having a big graph. Then ask students to place 5 leaves each into film canisters (or ziploc bags or cups). Now, graph the film canisters. As a class, discuss how and why the scale changed.****

Why do we change the scale on graphs?

Complete the bar graph on the next page. After you've finished, answer the following questions:

1) What kind of leaf does Merlin have most of? _____

2) What kind of leaf does Merlin have least of? _____

3) How many oak and maple leaves does Merlin have altogether? _____

Grade 3 DMactivity006 covers:

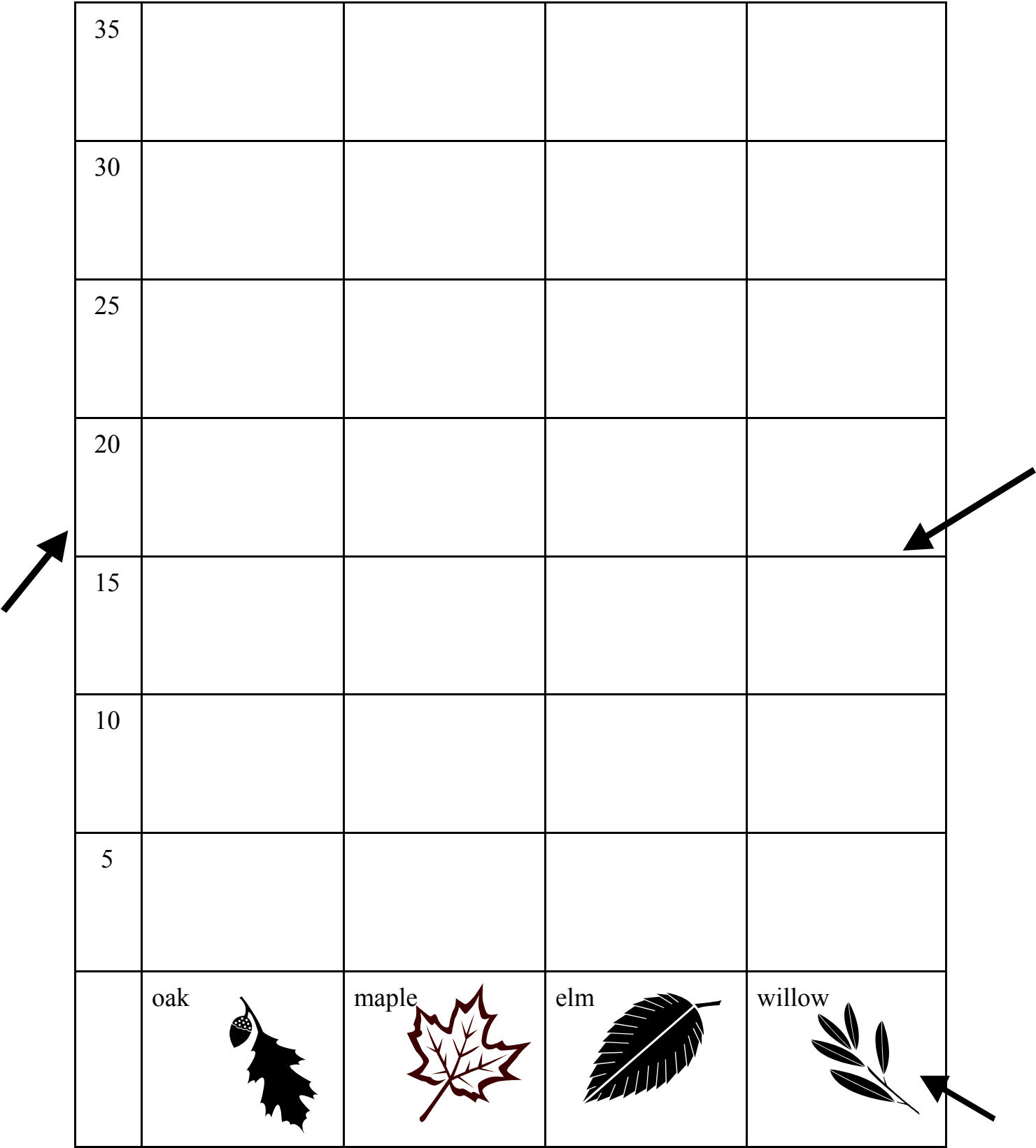
D7: construct bar graphs (with discrete classes on one axis and number on the other) and pictographs using scales with multiples of 2, 5 and 10

D8: interpret data from graphs (eg. bar graphs, pictographs, and circle graphs)

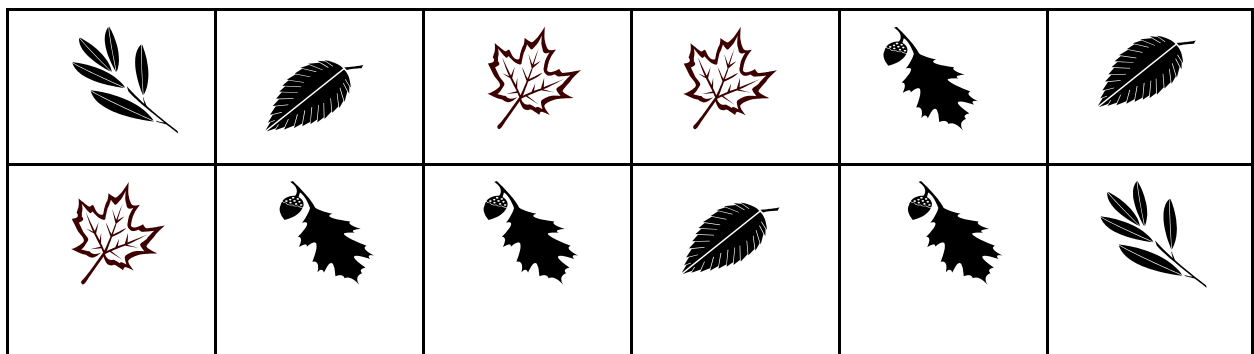
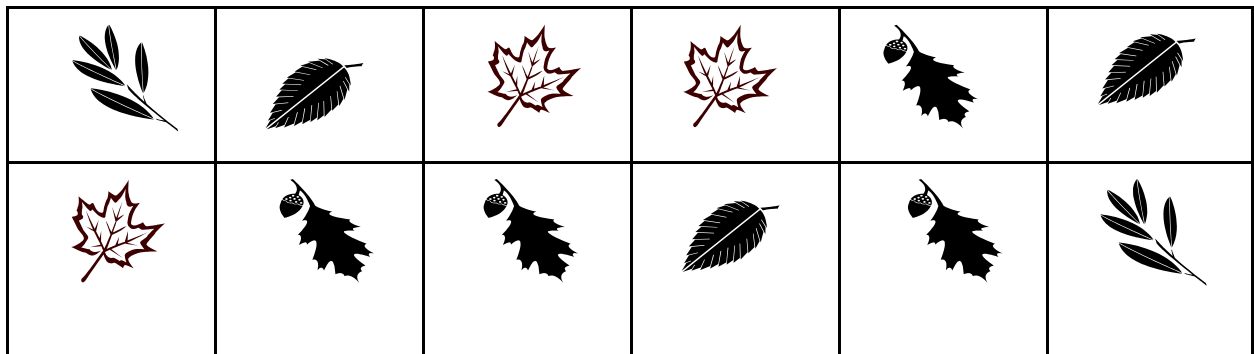
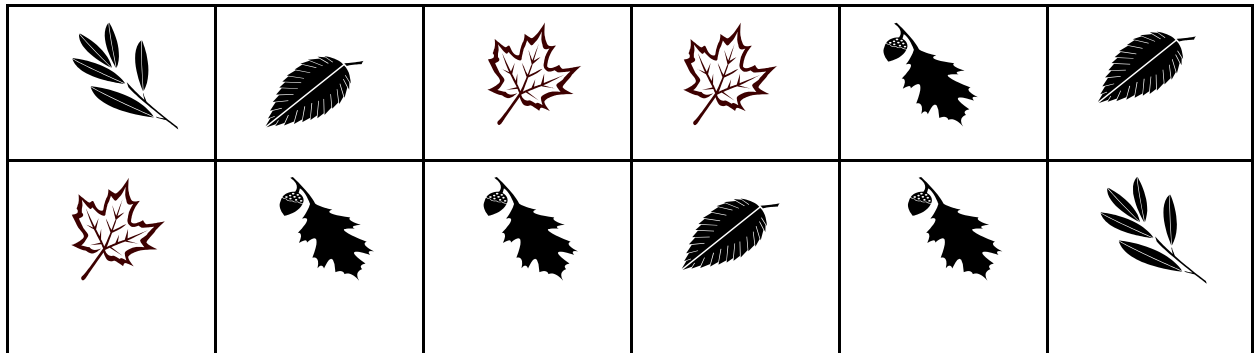
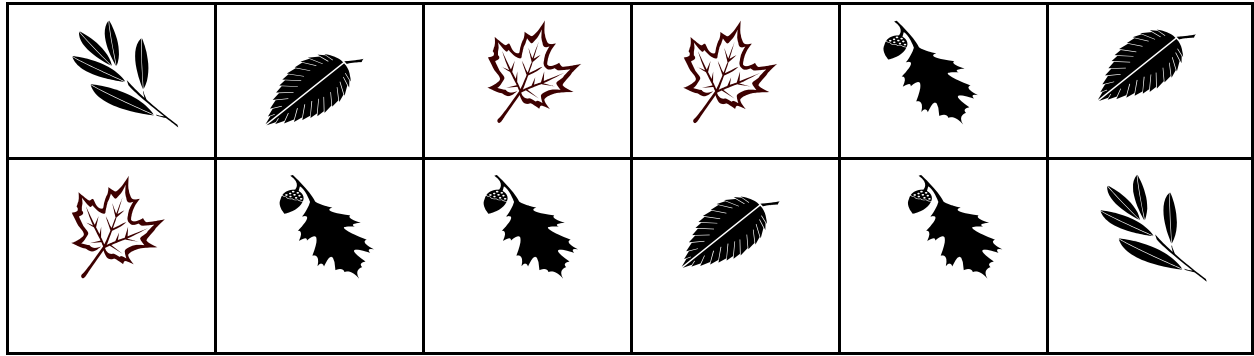
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Merlin is raking the leaves in his yard. He needs you to help him sort the leaves into different bins. Would you show Merlin how to graph his leaves so that he can easily see how many he has of each kind?

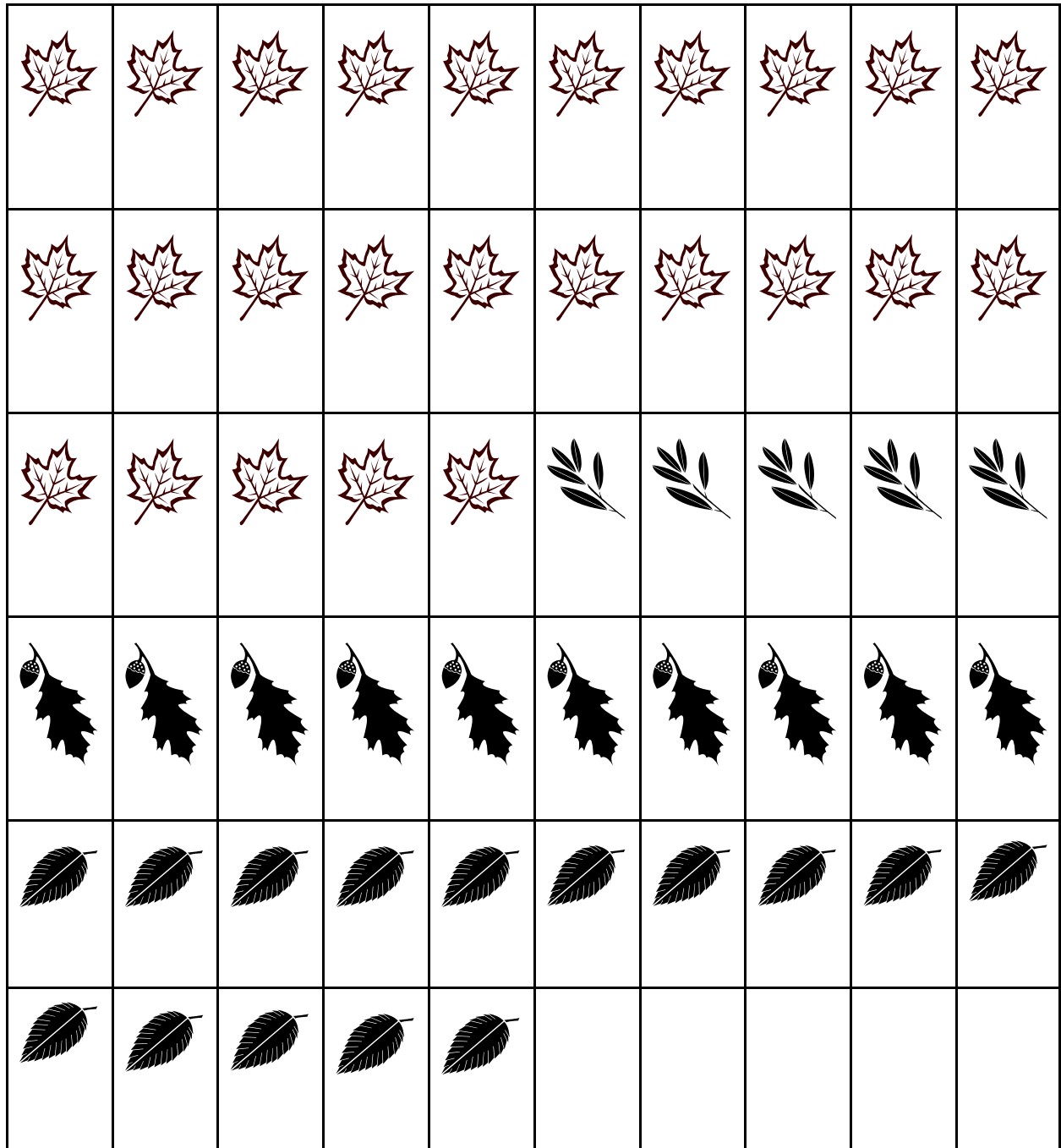




**** Photocopy for students****



**** Photocopy and cut out for the demonstration at the carpet.****





Data Management & Probability

Activity SEVEN

After raking the leaves in his lawn, Merlin decided to rake Gweneth's lawn. Merlin took a tally of each kind of leaf and he now needs your help to graph them. Remember, you might need to use a different kind of scale!

Oak	Maple	Elm	Willow
45	60	30	25

Scale												

What kind of leaf does Merlin have most of?

What kind of leaf does Merlin have least of?

How many maple and willow leaves does Merlin have altogether?

What else does the graph tell you?

Grade 3 DMactivity007 covers:

D7:construct bar graphs (with discrete classes on one axis and number on the other) and pictographs using scales with multiples of 2, 5, and 10

D8:interpret data from graphs(eg. bar graphs, pictographs, and circle graphs)

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Data Management & Probability Activity EIGHT

Merlin surveyed the wizards at his school to see what ice cream flavour was their favourite. He tallied his results below, but he doesn't think he can graph it because the numbers are too big! Will you help Merlin graph his ice cream survey results.

Chocolate	Vanilla	Strawberry	Other
110	90	60	20

What is the favourite ice cream flavour of the wizards surveyed?

What is the least favourite ice cream flavour of the wizards surveyed?

How many wizards were surveyed by Merlin?

What else does the graph tell you?

Grade 3 DMactivity008 covers:

D7:construct bar graphs (with discrete classes on one axis and number on the other) and pictographs using scales with multiples of 2, 5, and 10

D8:interpret data from graphs(eg. bar graphs, pictographs, and circle graphs)

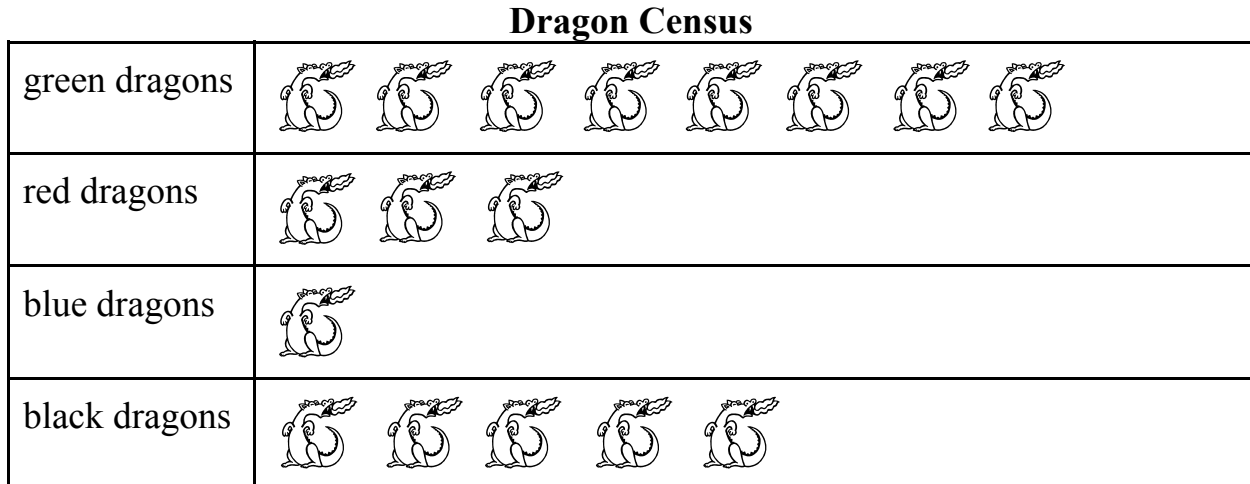
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Data Management & Probability

Activity NINE



Lots of dragons live in a forest next to Merlin's school. The results of the Ministry of Magical Creatures Dragon Census is displayed in the graph below.



 = 10 dragons

What is the definition of census?

An official count of the people or animals of a country or district

What is the scale of the graph above?

What does the graph “Ministry of Magical Creatures Dragon Census” communicate?

1)

2)

3)

Grade 3 DMactivity009 covers:

D5:relate objects to number on a graph with many-to-one correspondence (eg. 1 Canadian flag represents 100 Canadian citizens)

D8:interpret data from graphs (eg. bar graphs, pictographs, and circle graphs)

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Data Management & Probability

Activity TEN



**** Give each student a cup of smarties to use as there magic pebbles ****

Merlin has left some magic pebbles for each of you to graph. Graph the magic pebbles using a pictograph below. Make sure all the magic pebbles are graphed and your work is checked before they disappear!

What symbol will you use for your pictograph?

What is your scale? _____

Red	
Orange	
Yellow	
Green	
Blue	
Purple	
Brown	

What colour of magic pebble do you have the most of?

What colour of magic pebble do you have the least of?

What else does the graph tell you?

Grade 3 DMactivity010 covers:

D7: construct bar graphs (with discrete classes on one axis and number on the other) and pictographs using scales with multiples of 2, 5, and 10

D8: interpret data from graphs (eg. bar graphs, pictographs, and circle graphs)

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Data Management & Probability

Activity ELEVEN



**** At the carpet, complete the “Shoot and Score Pictograph” activity outlined on the next page****

At the carpet, we created the “Shoot and Score Pictograph” (Merlin likes hockey but he can’t skate!). Recently, Merlin has been studying the night sky. He has counted quite a few heavenly bodies and tallied them below. Help him create a pictograph of his night sky sightings.

Planets	Stars	Moons	Comets
100	950	200	300

What symbol will you use for your pictograph?

What is your scale? _____

What has Merlin seen most in the night sky?

How many planets, moons and comets has Merlin seen altogether?

What else does the graph tell you?

Grade 3 DMactivity011 covers:

D5: relate objects to number on a graph with many-to-one correspondence (eg. 1 Canadian flag represents 100 Canadian citizens)

D7: construct bar graphs (with discrete classes on one axis and number on the other) and pictographs using scales with multiples of 2, 5, and 10

D8: interpret data from graphs (eg. bar graphs, pictographs, and circle graphs)

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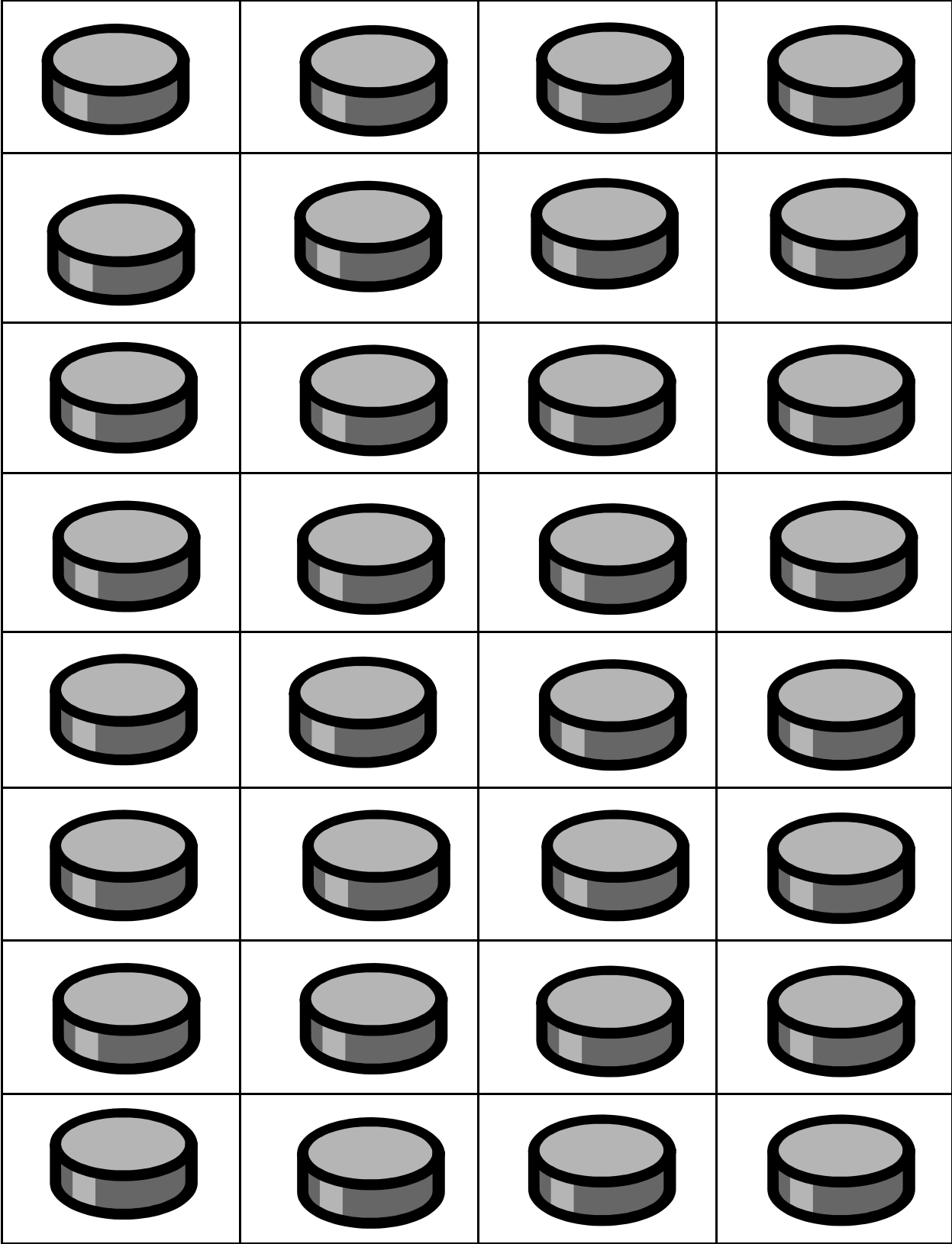
Shoots and Score Pictograph

**** Photocopy the hockey puck graphics on the next page twice. Cut out the pucks. Make sure you have at least 40 ****

**** Reproduce the data below on the chalk board or chart paper ****

**** At the carpet, or as a class create a pictograph using Hockey's top five career goal scorers data. Talk about how the pictograph will use the symbol of hockey pucks, and each hockey puck represents 100 goals scored. Talk about cutting a puck in half to represent 50 goals ****

Name	Wayne Gretzky	Gordie Howe	Marcel Dionne	Phil Esposito	Mark Messier
Goals Scored	862	801	731	717	575



Data Management & Probability

Activity TWELVE



Merlin's dog, Leo, loves to dig up bones. He finds all kinds of different coloured bones! Merlin has tallied all the bones Leo has dug up. Create a pictograph of Leo's bone collection.

Purple	Green	Blue	Orange
35	20	5	15

What symbol will you use for your pictograph?

What is your scale? _____

What colour of bone has Leo dug up the most?

What colour of bone has Leo dug up the least?

How many blue and orange bones has Leo dug up altogether?

What else does the graph tell you?

Grade 3 DMactivity012 covers:

D5: relate objects to number on a graph with many-to-one correspondence (eg. 1 Canadian flag represents 100 Canadian citizens)

D7: construct bar graphs (with discrete classes on one axis and number on the other) and pictographs using scales with multiples of 2, 5, and 10

D8: interpret data from graphs (eg. bar graphs, pictographs, and circle graphs)

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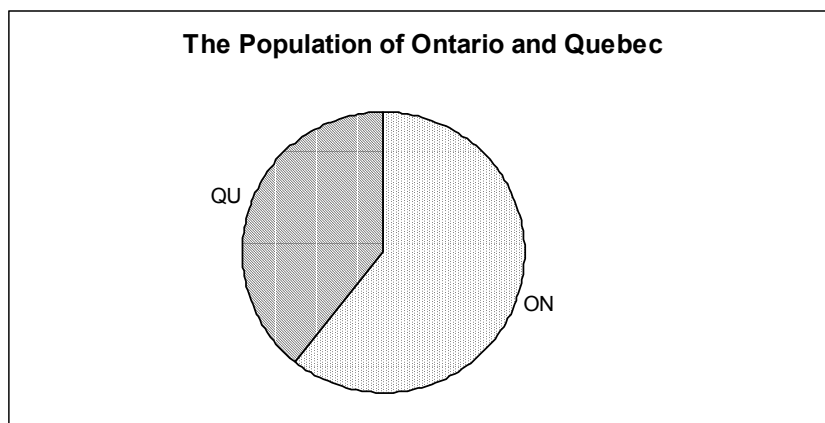


Data Management & Probability

Activity THIRTEEN

**** Turning the daily attendance graph into pie graphs on data management Fridays is an excellent introduction to pie graphs. ****

With a partner, look at the following three pie graphs. In the space provided, describe three things that the pie graphs communicate.

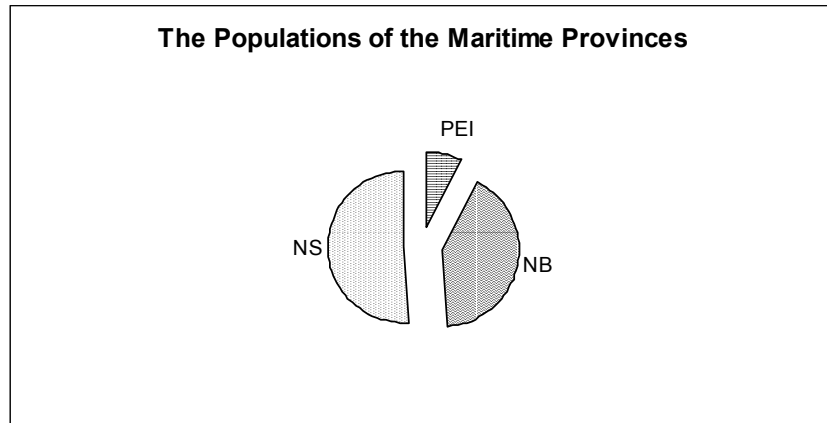


What does the graph “The population of Ontario and Quebec” communicate?

1) _____

2) _____

3) _____

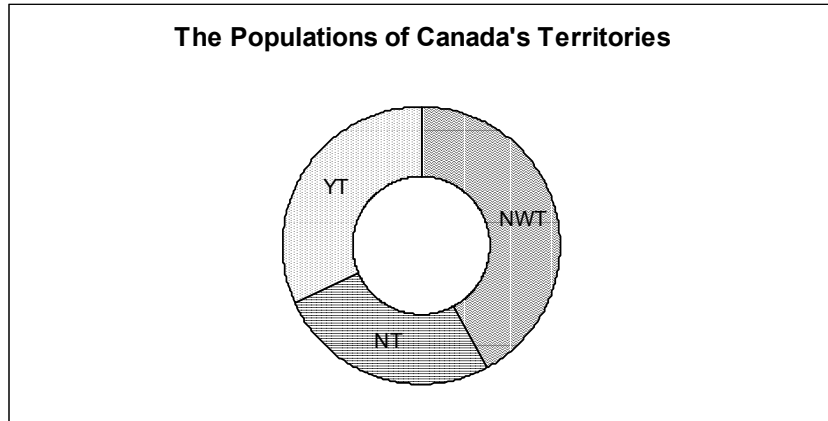


What does the graph “The Population of the Maritime Provinces” communicate?

1) _____

2) _____

3) _____



What does the graph “The Population of Canada’s Territories” communicate?

1) _____

2) _____

3) _____

What are some similarities between the three different kinds of pie graphs?

What are some differences between the three different kinds of pie graphs?

Grade 3 DMactivity013 covers:

D8:interpret data from graphs (eg. bar graphs, pictographs, and circle graphs)

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Data Management & Probability

Activity FOURTEEN



Today we will be conducting class surveys. In groups of four, you will work together to create a good survey question, survey the class, create a graph and present your results to the class.

**** Groups may be formed through a random process (like selecting the same pieces of a four piece puzzle in a pile), by a teacher selected process, by a student selected process, or by using regular seating arrangement groups. ****

My group includes: _____

Step ONE:

Our survey question is:

This question is important because:

Our choices include (up to five choices):

Step TWO:

Survey the class using your tally chart below. Make sure you put your choices on the top of each column.

Step THREE:

Graph your data using the chart paper below.

[illegible]

Step FOUR:

What three things does your survey communicate?

1) _____

2) _____

3) _____

Step FIVE:

Present your findings to the class. Be sure to describe the importance of your survey question and how you are going to use this data to make our classroom a better place. You will be marked using the following rubric:

Criteria	Level 1	Level 2	Level 3	Level 4
Understanding of concepts	<ul style="list-style-type: none">• A question with finite answers was chosen• Transfer of data from tally chart to graph was incomplete	<ul style="list-style-type: none">• A question with finite answers was chosen• Tally data was transferred to the graph	<ul style="list-style-type: none">• An appropriate question with finite answers was chosen• Tally data was transferred to the graph effectively	<ul style="list-style-type: none">• A question with significance to daily classroom life was posed• Tally data was transferred to the graph effectively, and helped communicate the survey results to the audience
Communication of required knowledge	<ul style="list-style-type: none">• Survey results are explained, however, are incomplete	<ul style="list-style-type: none">• Survey results are explained• Importance or applicability are limited	<ul style="list-style-type: none">• Survey results, importance of survey and implications for the classroom were clearly explained	<ul style="list-style-type: none">• The survey conducted was clearly explained• Results are enlightening and implementable

Grade 3 DMactivity014 covers:

D3:generate questions that have a finite number of responses for their own surveys

D4:use their questions as a basis for collecting data

D7:construct bar graphs (with discrete classes on one axis and number on the other) and pictographs using scales with multiples of 2, 5, and 10

D8:interpret data from graphs (eg. bar graphs, pictographs, and circle graphs)

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Data Management & Probability

Activity FIFTEEN



For the next two data management & probability classes we will be conducting a school survey. We will be asking two different survey questions. These questions should reflect important issues in the school and may help create some solutions.

Step ONE:

As a class, let's decide what our school survey questions are:

1) _____

2) _____

These questions are important because:

Our choices include (up to four choices):

For question 1: _____

For question 2: _____

Step TWO:

To survey the school, we will divide the classrooms up amongst the groups. Each group will be responsible for recording the data from their assigned classrooms for each question.

My group includes: _____

When you enter the classroom, make sure you show the teacher the note on the following page, so that they can help you conduct the survey.

Dear Teacher,

We are surveying the school about three important questions. We will read the question and the four available choices. We will then repeat each choice, one at a time, giving the students a chance to respond by raising their hands. We appreciate your help.

Question 1: _____

Tally Chart

Choices ·				
class one: _____				
class two: _____				
class three: _____				

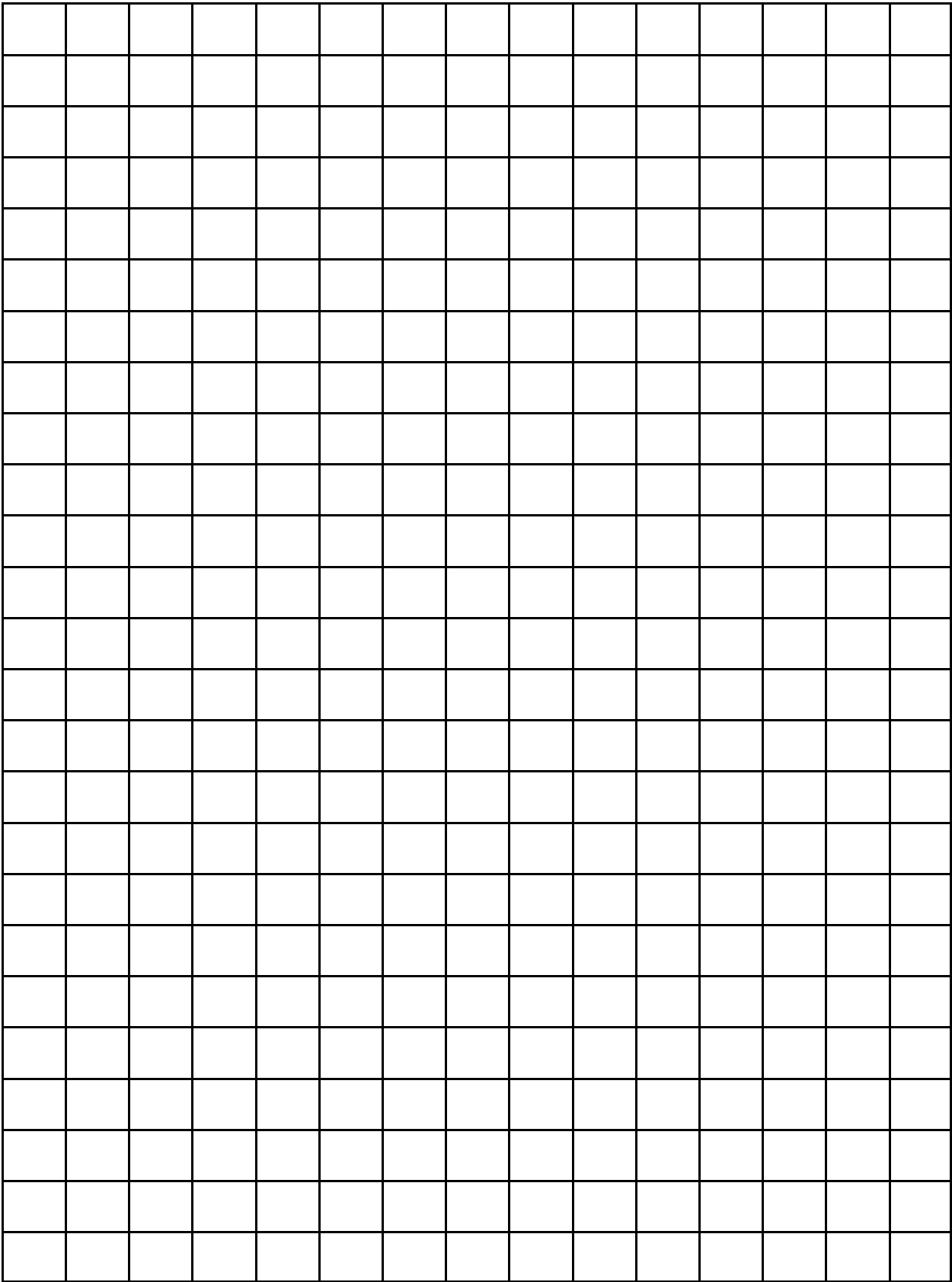
Question 2: _____

Tally Chart

Choices ·				
class one: _____				
class two: _____				
class three: _____				

Step THREE:

Graph the data from the classes you surveyed using the chart paper below.



Step FOUR:

What three things does your survey communicate?

- 1) _____

- 2) _____

- 3) _____

Step FIVE:

Once you've finished analysing the data you collected from your assigned classrooms, enter the data into the spread sheet program.

**** Choose the spread sheet software program you are most comfortable with (Excel, Quatro Pro or Appleworks are examples). Set up a spreadsheet in the chosen software so that the individual class tallies can be entered and then added up automatically into a school total. Make sure all students save to the master file and that all students are able to access this file later. A sample of this spreadsheet is available at www.bonfieldpublicschool.com in Microsoft Excel. Once you've downloaded the file you may personalize it by replacing the actual questions, choices and class names (3A or by teacher names). ****

Step SIX:

Open the spread sheet file with the school survey data. Make a computer graph of both questions and print them off.

What two conveniences did the spread sheet offer you in analysing your data?

- 1) _____

- 2) _____

Grade 3 DMactivity014 covers:

D3:generate questions that have a finite number of responses for their own surveys

D4:use their questions as a basis for collecting data

D7:construct bar graphs (with discrete classes on one axis and number on the other) and pictographs using scales with multiples of 2, 5, and 10

D8:interpret data from graphs (eg. bar graphs, pictographs, and circle graphs)

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Data Management & Probability

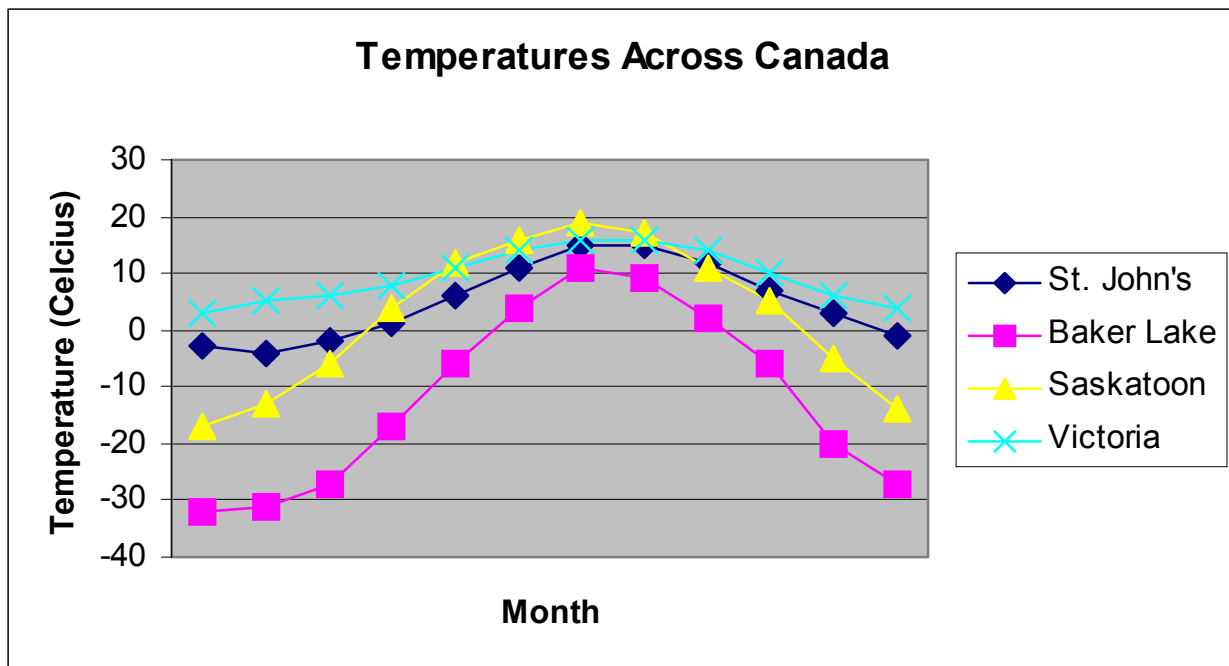
Activity SIXTEEN



**** Recording the daily temperature with a line graph is a great introduction to line graphs. ****

Line graphs are another kind of graph. They are usually used for recording temperature, the ups and downs of the stock market, or the speed of a car. Line graphs are used when you want to record information from one source over a period of time.

With a partner, look at the following line graph. It is a graph of the average monthly temperature in four different cities across Canada. In the space provided, describe three things that the line graph communicates.



What does the graph “Temperatures Across Canada” communicate?

- 1) _____
- 2) _____
- 3) _____



Data Management & Probability

Activity SEVENTEEN

**** You could use buttons or beads for this activity.****

Merlin has left you a cup of buttons. He would like your help sorting them. Sort your magical buttons and then draw and write about what you did.

Draw your sort:

Describe your sort in words:

What rule did you use?

Merlin has a Problem!

Merlin has a problem. He is brewing a new spell and he needs three numbers. When he opens the package of numbers he finds four. Help Merlin pick which number doesn't belong and doesn't go in the spell.

1993	1991
1919	9191

Circle the number that doesn't belong.

Explain why it doesn't belong in the spell.

Answer:

1993 - because it has a three instead of just ones and nines

1991 - because it is a palindrome and none of the other numbers are palindromes

1919 - because it has a one in the tens column instead of a nine

9191 - because it starts with a nine instead of a one

Grade 3 DMactivity017 covers:

D1: use two or more attributes (eg. colour, texture, length) to sort objects and data

D2: select appropriate methods (eg. charts, Venn diagrams) to cross-classify objects

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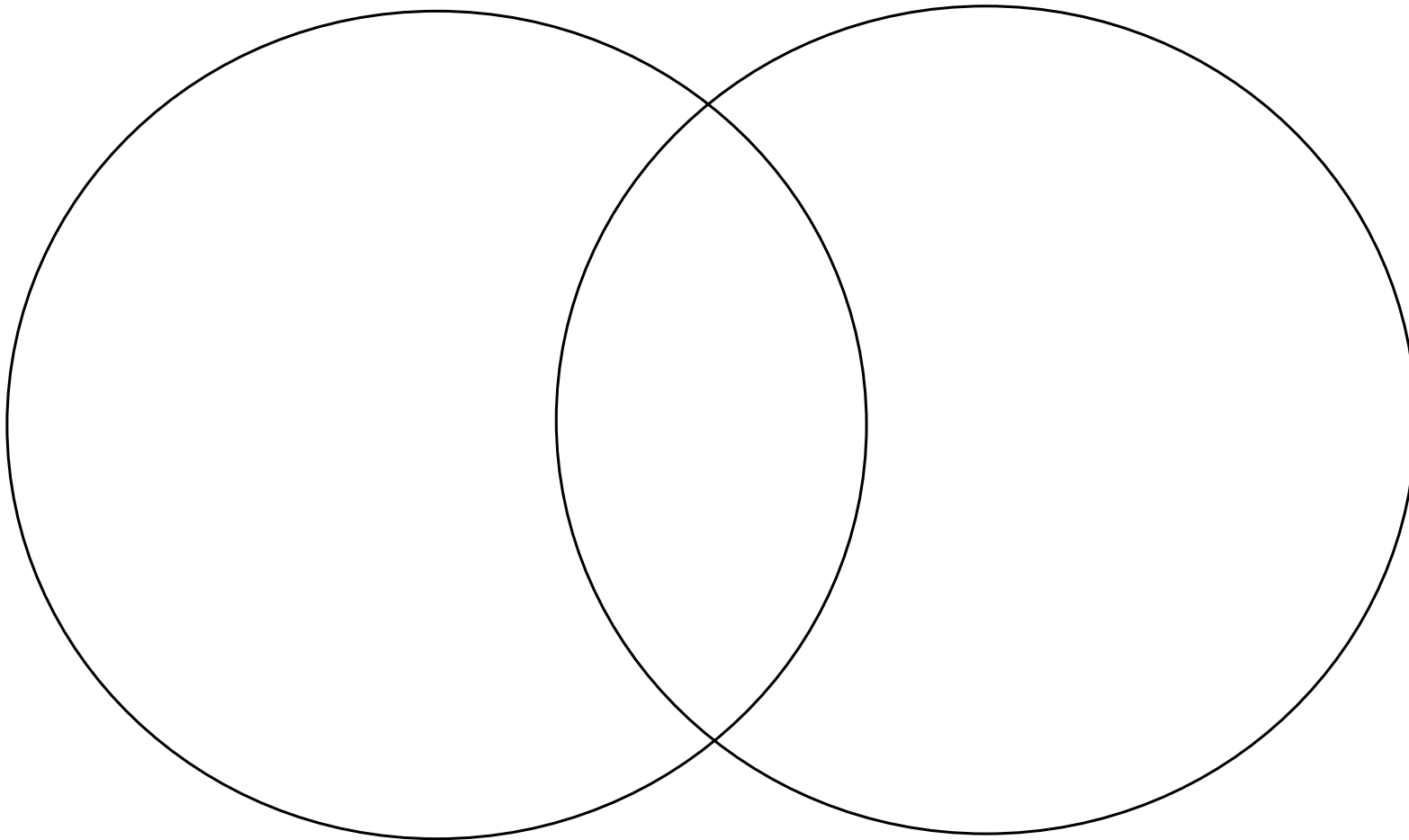
Data Management & Probability

Activity EIGHTEEN



**** Do an example at the carpet with coloured pasta (see materials for recipe) or using sorting objects.****

Help Merlin sort his buttons into a DOUBLE Venn diagram.



Grade 3 DMactivity018 covers:

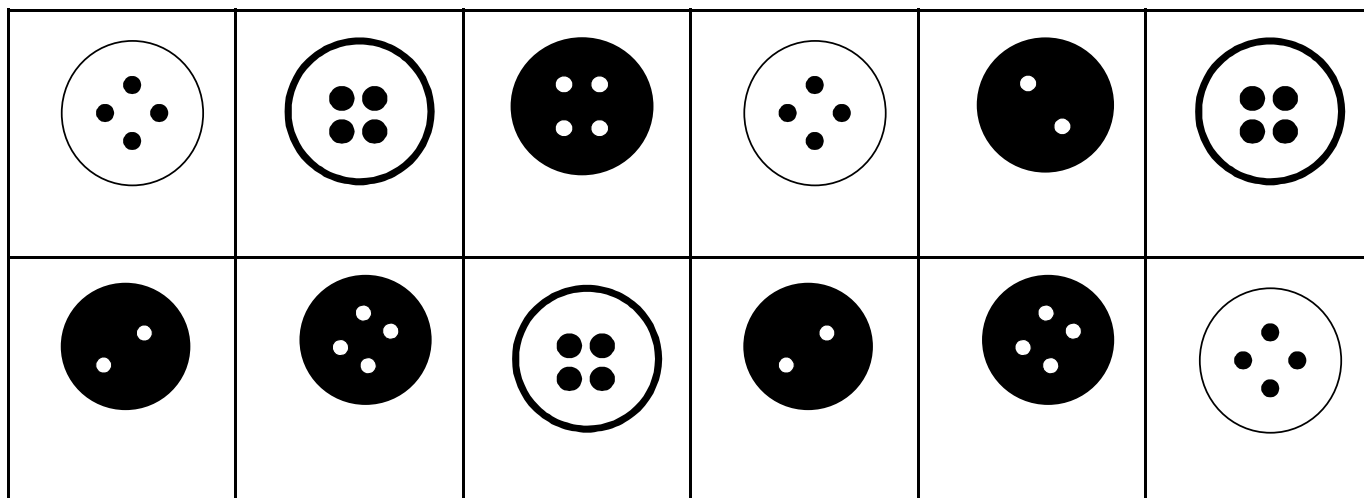
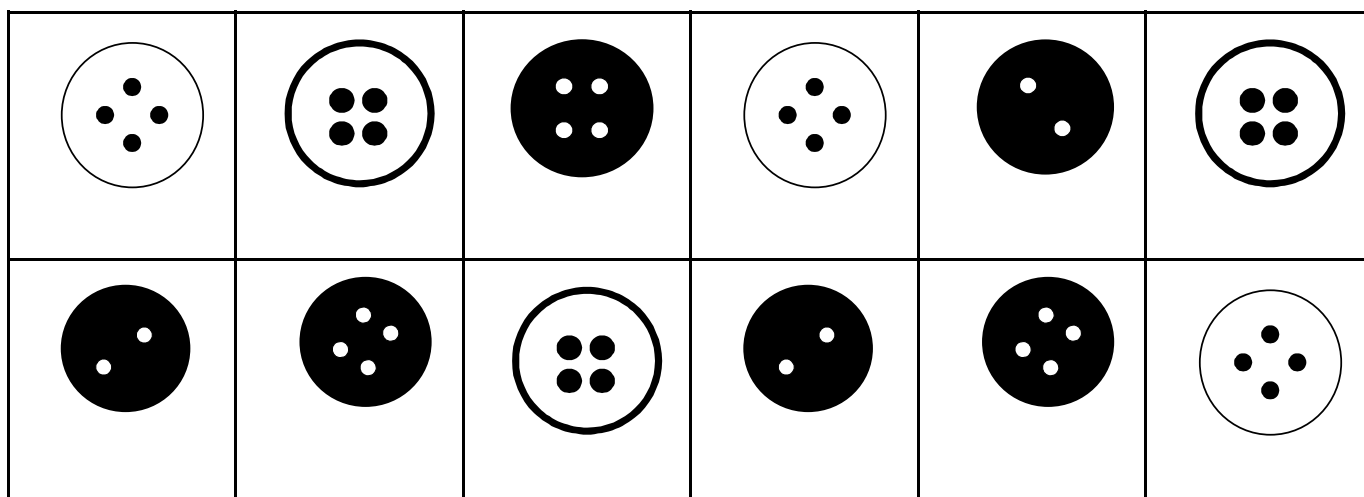
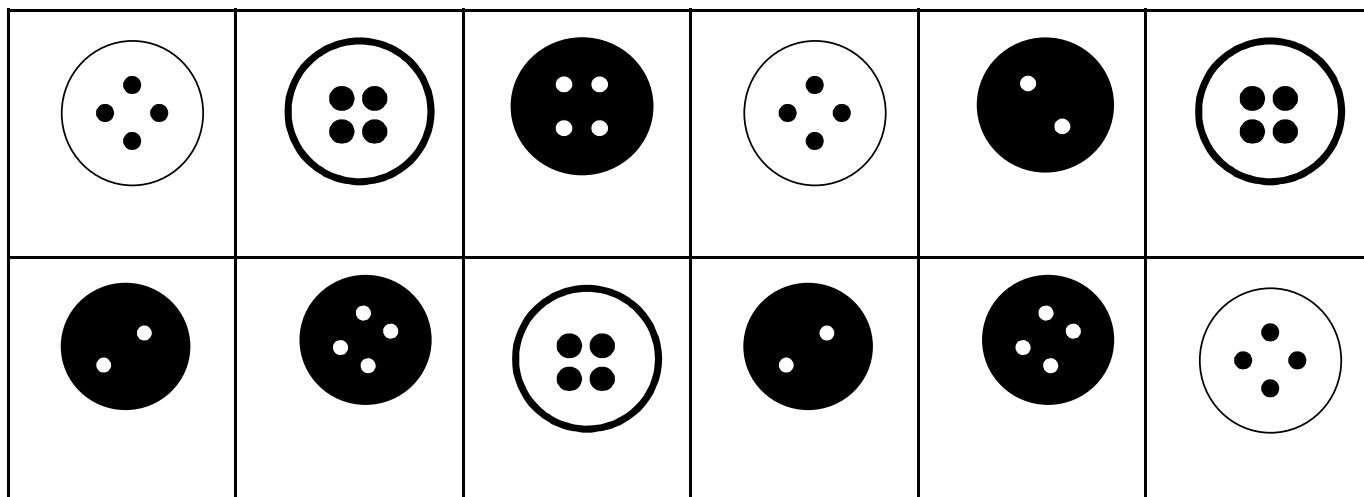
D1: use two or more attributes (eg. colour, texture, length) to sort objects and data

D2: select appropriate methods (eg. charts, Venn diagrams) to cross-classify objects

D6: organize data in Venn diagrams and charts using several criteria

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**** Photocopy for students ****



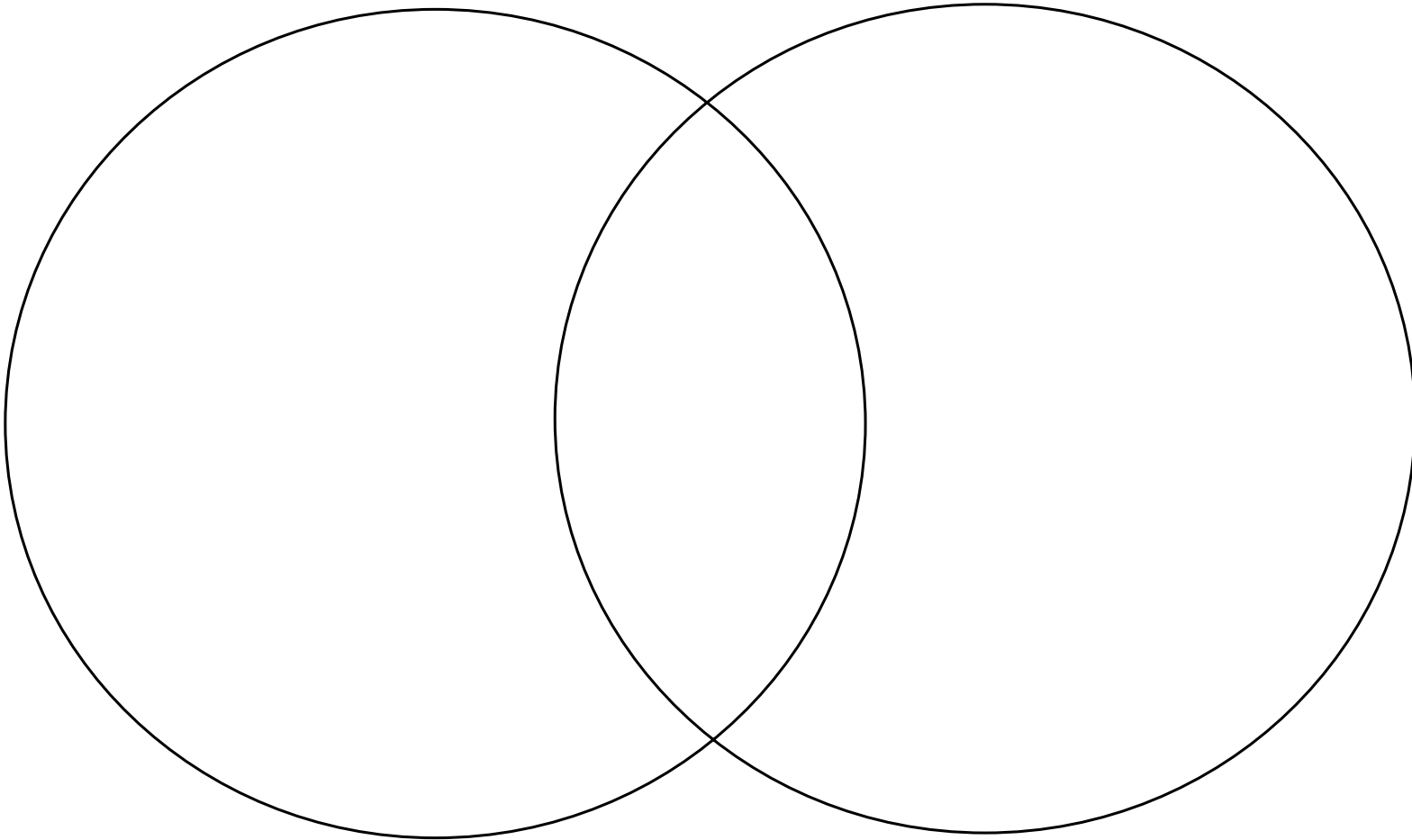
Data Management & Probability

Activity NINETEEN



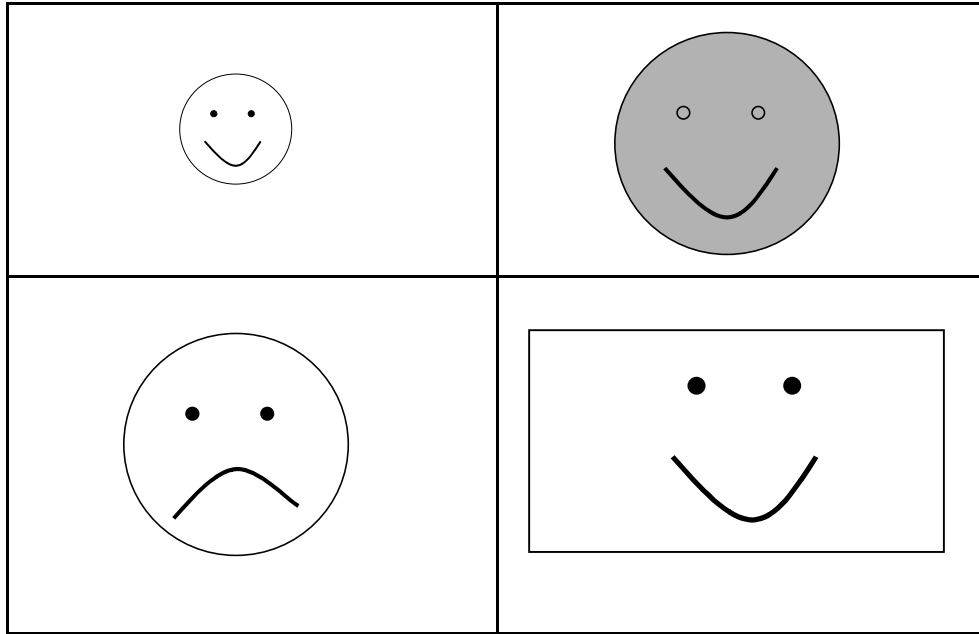
**** Do an example at the carpet.****

Help Merlin sort the plants and food into a DOUBLE Venn diagram.



Merlin has a Problem!

Merlin has a problem. He is brewing a new spell and he needs three shapes. When he opens the package of shapes, he finds four. Help Merlin pick which shape doesn't belong and doesn't go in the spell.



Circle the shape that doesn't belong.

Explain why it doesn't belong

Answer:

Top Left - because it is smaller

Top Right - because it is grey

Bottom Left - because it is sad

Bottom Right - because it is rectangular

Grade 3 DMactivity019 covers:

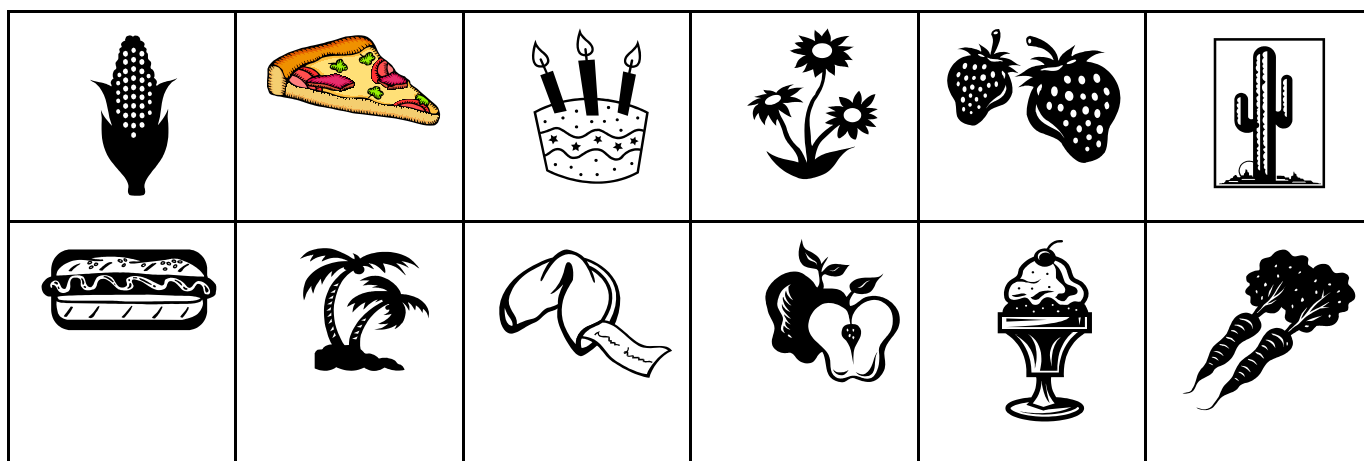
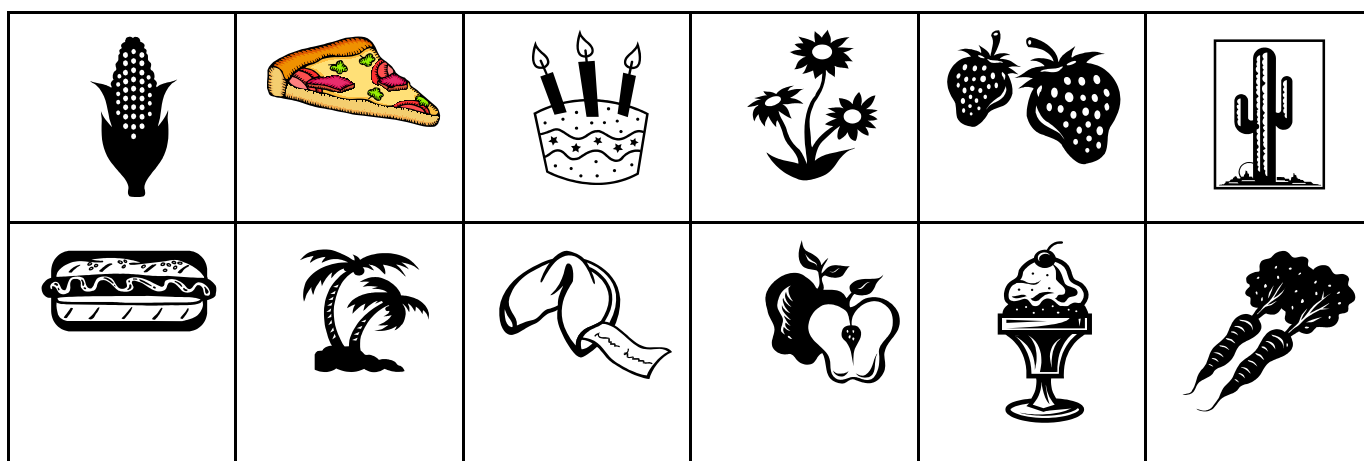
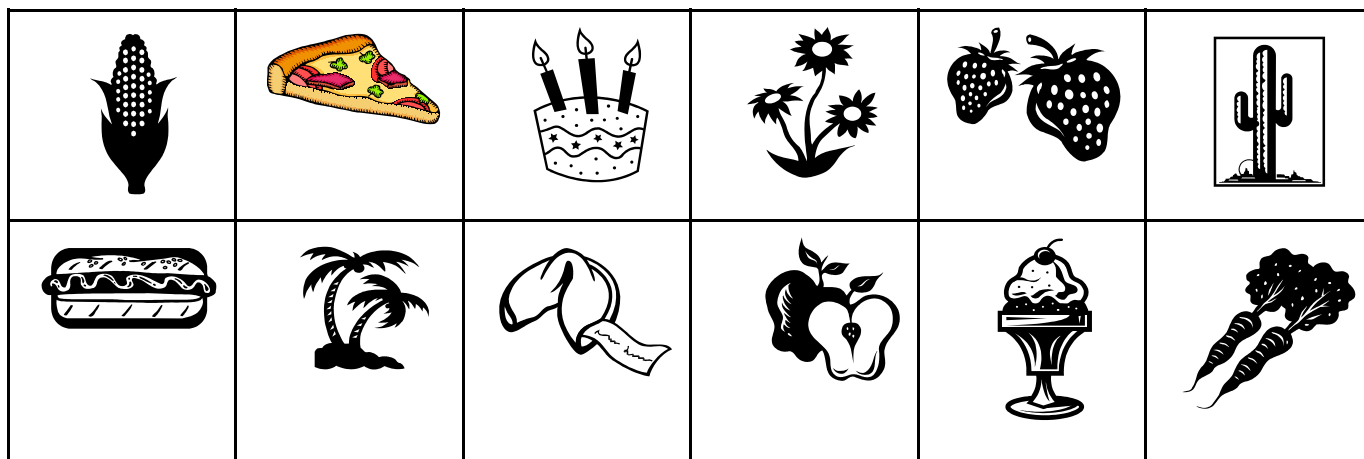
D1: use two or more attributes (eg. colour, texture, length) to sort objects and data

D2: select appropriate methods (eg. charts, Venn diagrams) to cross-classify objects

D6: organize data in Venn diagrams and charts using several criteria

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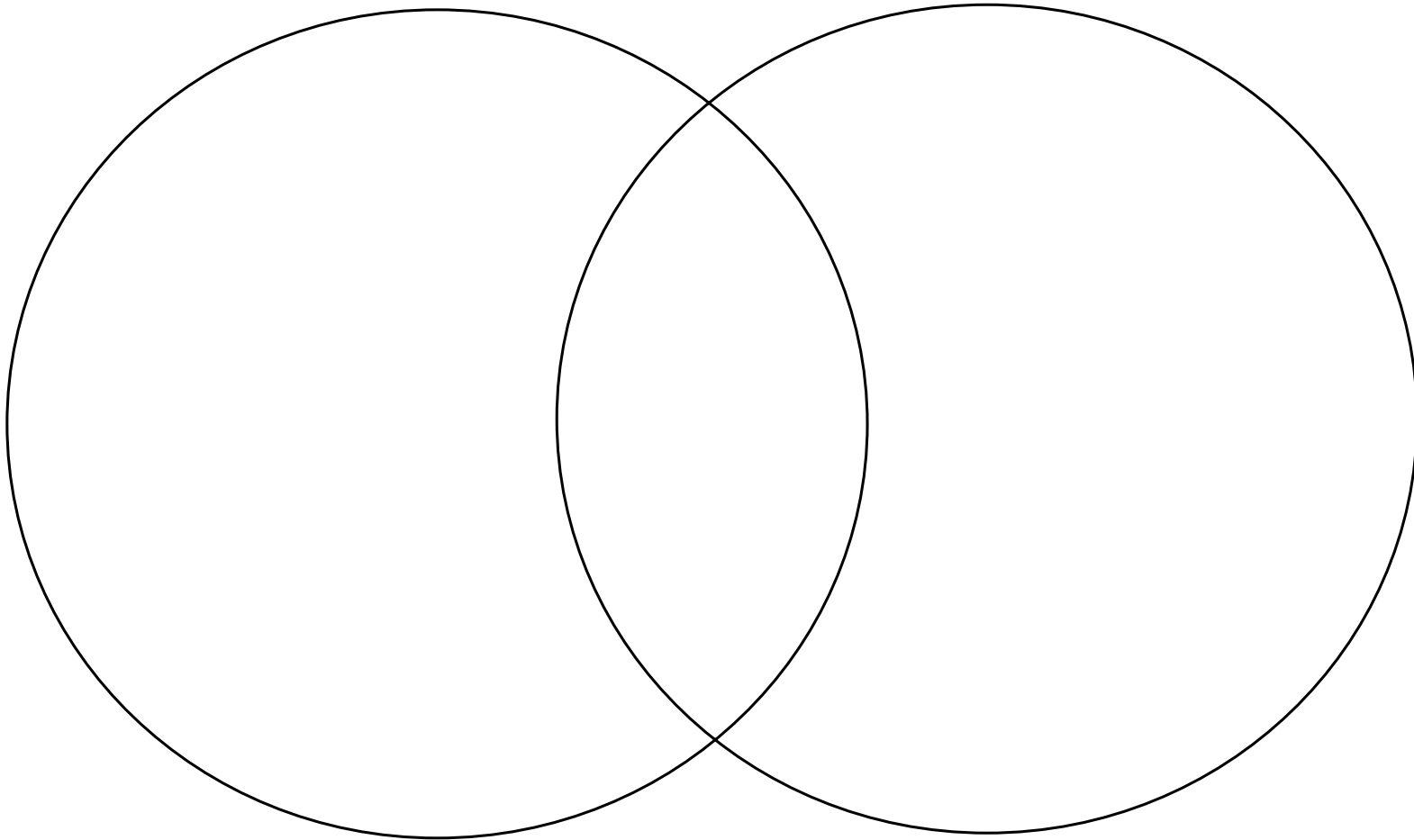
Data Management & Probability

Activity TWENTY



**** Do an example at the carpet with sorting objects.****

Help Merlin sort the two-dimensional shapes into a DOUBLE Venn diagram.



Grade 3 DMactivity020 covers:

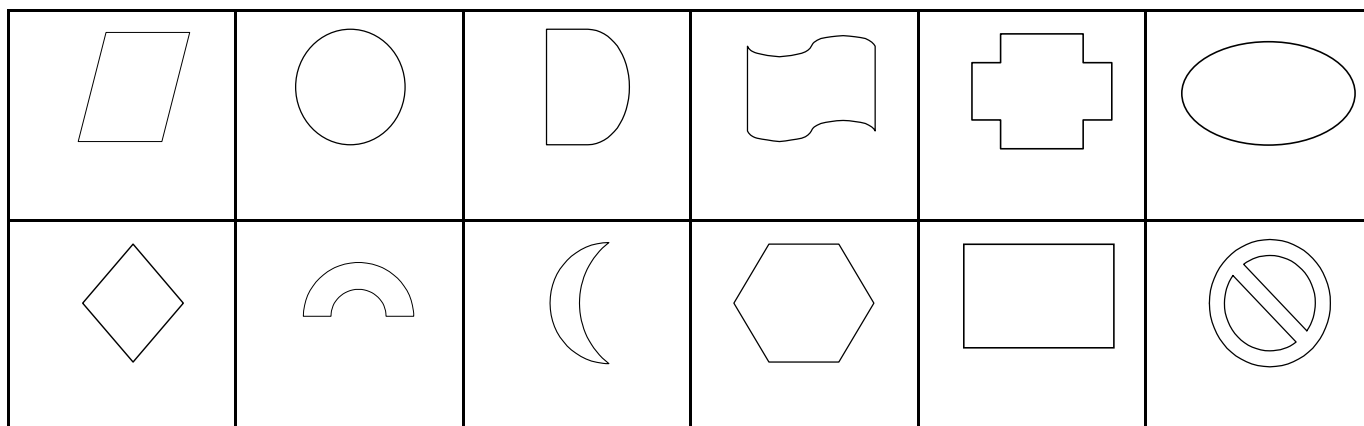
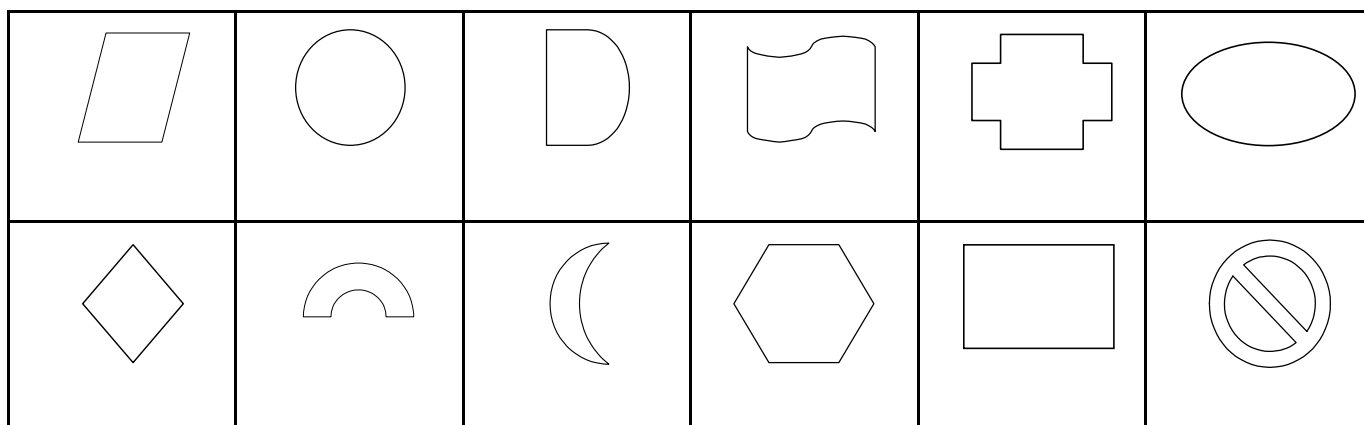
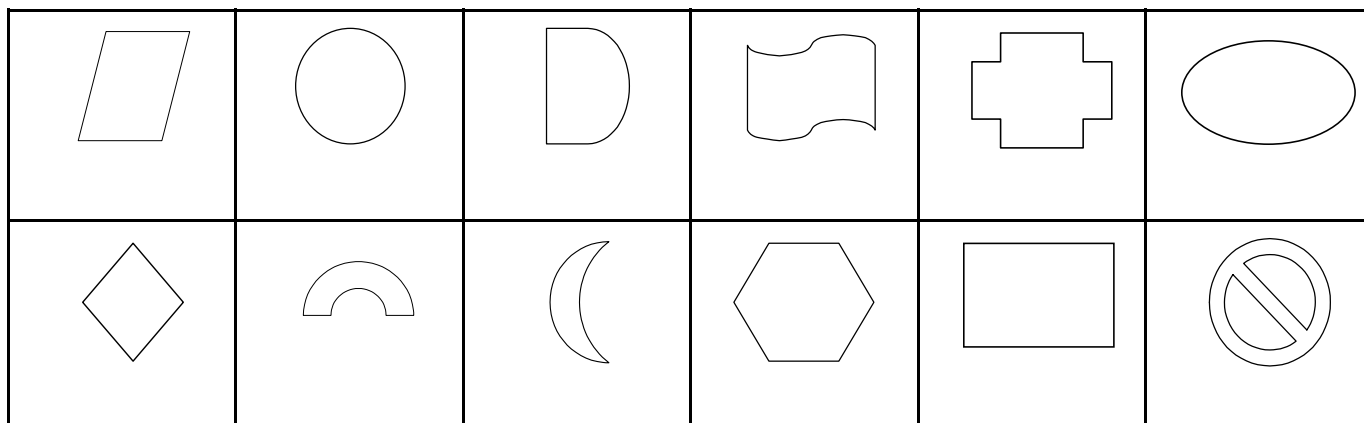
D1: use two or more attributes (eg. colour, texture, length) to sort objects and data

D2: select appropriate methods (eg. charts, Venn diagrams) to cross-classify objects

D6: organize data in Venn diagrams and charts using several criteria

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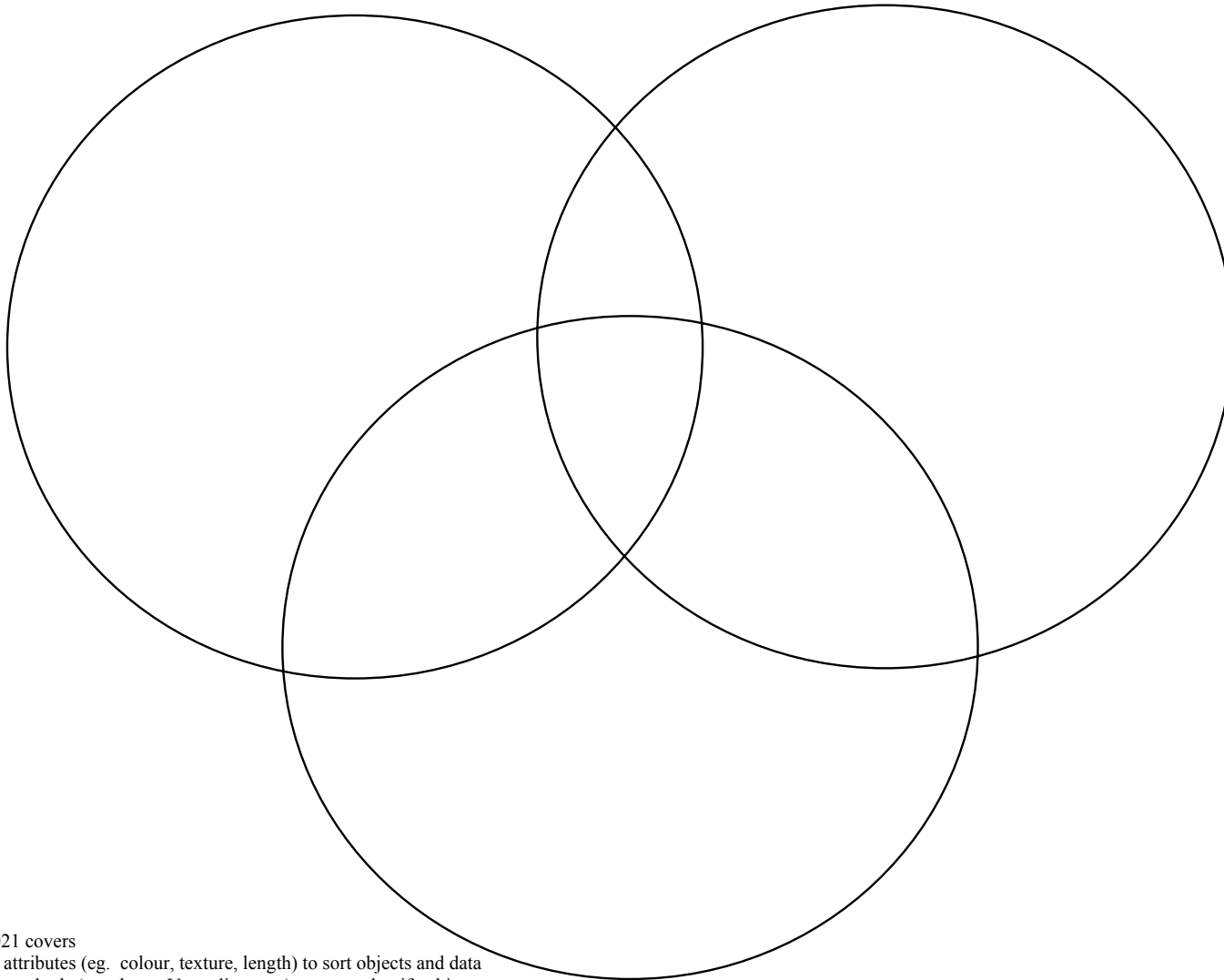


Data Management & Probability

Activity TWENTY-ONE

**** Do a sample triple Venn diagram at the carpet****

Help Merlin sort the snowmen into a TRIPLE Venn diagram.



Grade 3 DMactivity021 covers

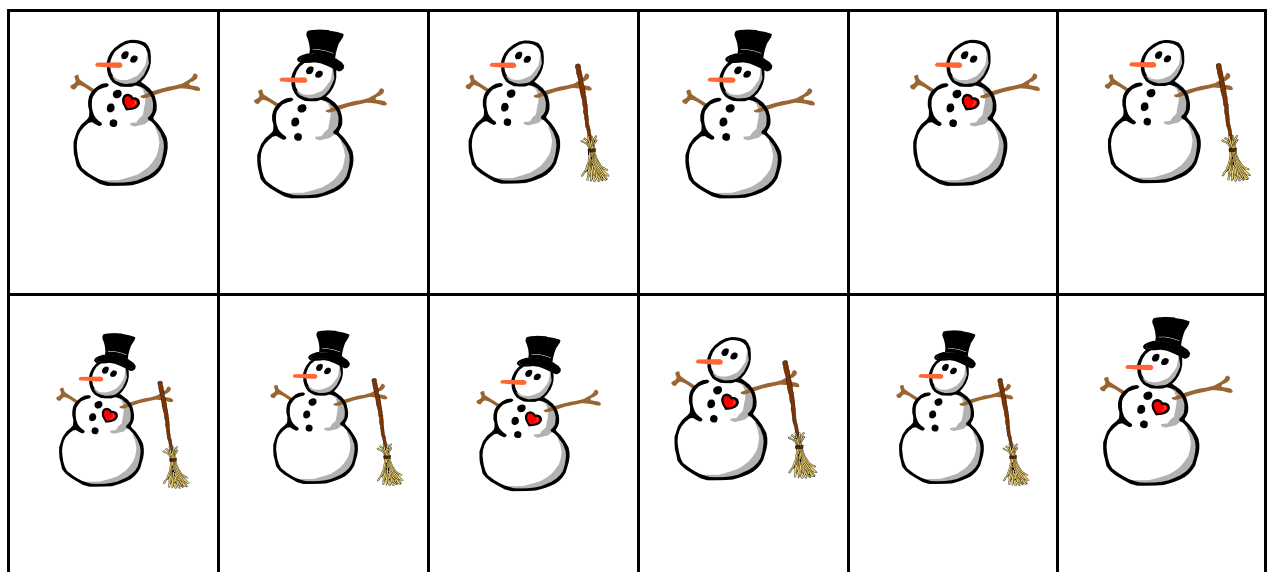
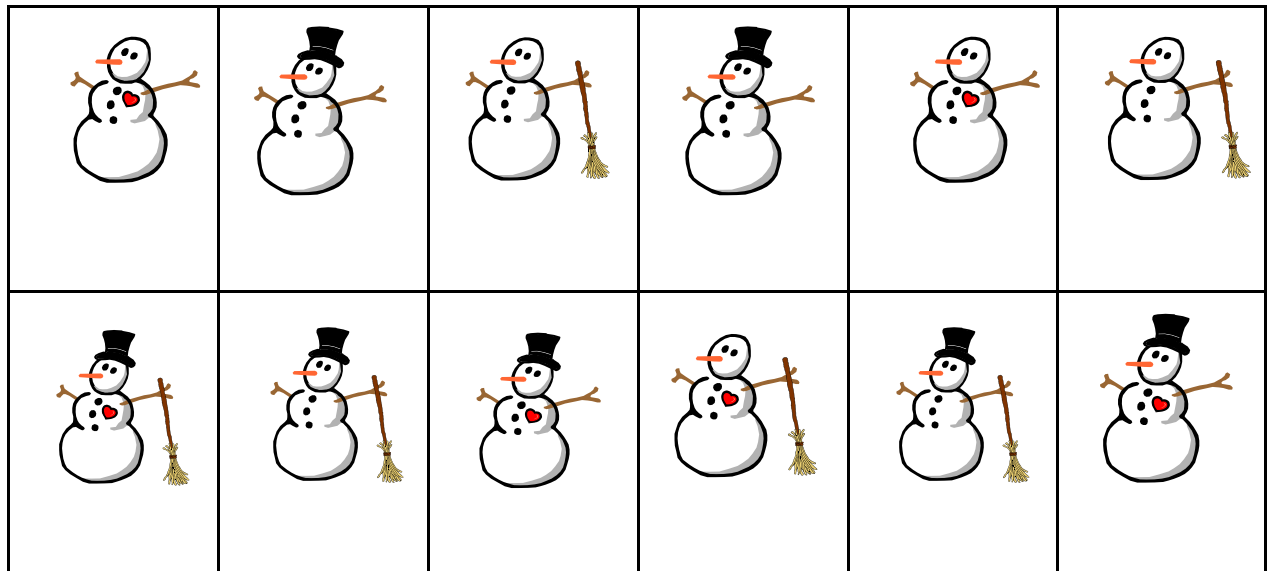
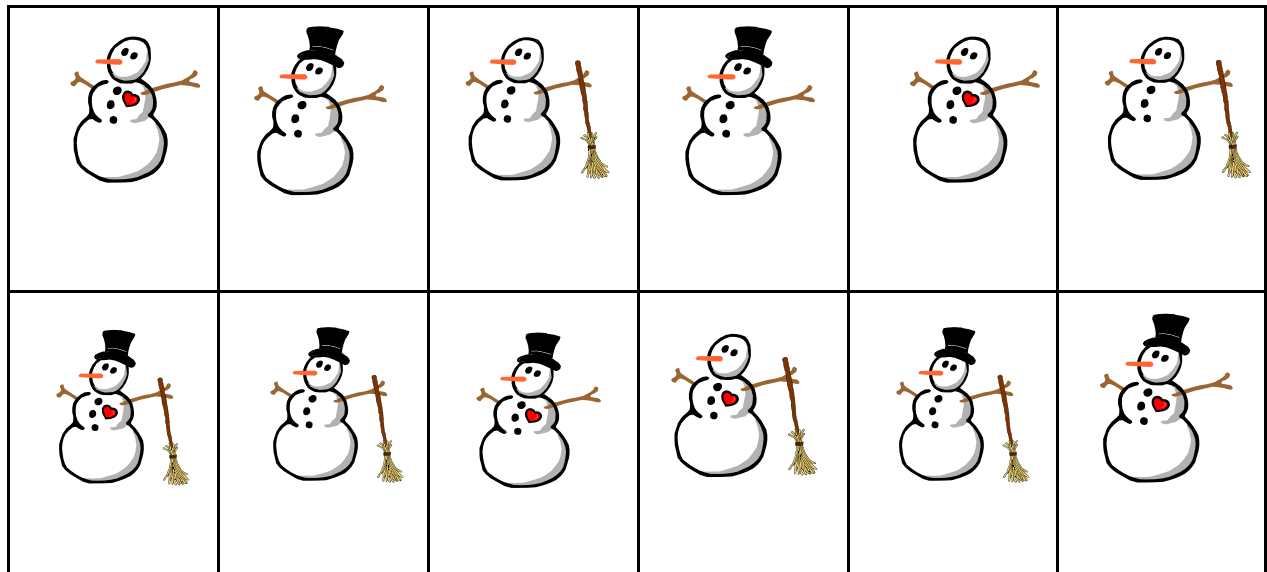
D1: use two or more attributes (eg. colour, texture, length) to sort objects and data

D2: select appropriate methods (eg. charts, Venn diagrams) to cross-classify objects

D6: organize data in Venn diagrams and charts using several criteria

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Data Management & Probability

Activity TWENTY-TWO



Today we are going to start studying probability. What is the definition of probability?

It is a number that shows how likely it is that an event will happen.

Coins have two sides. One side is called “heads” because it has a picture of Queen Elizabeth’s head and the other side is called “tails”. Different types of coins have a different tail picture. All Canadian nickels have beavers.



Merlin has given you a magic coin to conduct some probability experiments.

**** Conduct a probability experiment at the carpet and demonstrate that probability is represented as a fraction (the result / the total number of tosses) ****

Probability Experiment ONE

PREDICT which side you think is luckier? Circle one.

Heads	Tails
-------	-------

Toss the coin TEN times. Record your results in the tally chart below.

	Tally Marks	Total
Heads		
Tails		

Which side came up the most? _____

Did you predict correctly? _____

What is the probability of tossing a HEADS? _____

Probability Experiment TWO

PREDICT which side you think is luckier? Circle one.

Heads	Tails
-------	-------

Toss the coin TWENTY times. Record your results in the tally chart below.

	Tally Marks	Total
Heads		
Tails		

Which side came up the most? _____

Did you predict correctly? _____

What is the probability of tossing a HEADS? _____

Probability Experiment THREE

PREDICT which side you think is luckier? Circle one.

Heads	Tails
-------	-------

Toss the coin THIRTY times. Record your results in the tally chart below.

	Tally Marks	Total
Heads		
Tails		

Which side came up the most? _____

Did you predict correctly? _____

What is the probability of tossing a HEADS? _____

Is there an equal chance of tossing a heads or tails each time you toss the coin?

Explain:

Merlin has a problem!

Gweneth ordered an ice-cream cone with one scoop of chocolate, one scoop of strawberry and one scoop of vanilla. How many different ways could Merlin place the scoops on Gweneth's cone?

Explain your answer:



Data Management & Probability

Activity TWENTY-THREE

**** Do an example probability experiment with die at the carpet. ****

Today, Merlin has left you magic dice. He would like you to conduct some probability experiments with the die. Record your results in the tally charts provided and be sure to answer all the questions.

Probability Experiment ONE

Roll the die TEN times. Record it in the chart below.

Die	Tally Marks	Total
1		
2		
3		
4		
5		
6		

- 1) Which number was rolled the most? _____
- 2) Which number was rolled the least? _____
- 3) How many 2's and 5's altogether? _____

Probability Experiment TWO

Roll the die TWENTY times. Record it in the chart below.

Die	Tally Marks	Total
1		
2		
3		
4		
5		
6		

1) Which number was rolled the most? _____

2) Which number was rolled the least? _____

3) How many 3's and 6's altogether? _____

Probability Experiment THREE

Roll the die THIRTY times. Record it in the chart below.

Die	Tally Marks	Total
1		
2		
3		
4		
5		
6		

1) Which number was rolled the most? _____

2) Which number was rolled the least? _____

3) How many 1's and 4's altogether? _____

Merlin wants to know how many of each number you rolled altogether, in all three tally charts? Fill in the chart below.

Die	1	2	3	4	5	6
Altogether						

What do you think will be your luckiest number and why?

With a witness watching, roll your die and record what you received.

You rolled a

If you predicted correctly, write your name on the board.

Do you think there is an equal chance of receiving any number on the die? _____

Explain:

Grade 3 DMactivity024 covers:

D9:conduct simple probability experiments (eg. rolling a number cube, spinning a spinner) and predict the results

D11:predict the probability that an event will occur

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Data Management & Probability

Activity TWENTY-FOUR



Merlin has a Problem!

Merlin just received three new shirts and three new pants as a gift! He got a red shirt, a green shirt and a yellow shirt. The three pants he got were brown, black and blue. How many different combinations of shirts and pants could Merlin make into outfits?

Explain your solution:

Leap Frog

Directions:

- 1) This game is for TWO players.
- 2) You will need 6 red lima beans and 6 blue lima bean markers.
- 3) You will also need a pair of dice and the game board on the next page.
- 4) Each person will roll one die. The person with the highest roll will pick their lima bean marker colour and place ONE lima bean on any lily pad numbered 1 to 12.
- 5) The other person will place ONE of their lima beans on any lily pad numbered 1 to 12. BUT you can't put a lima bean on a number that has already been chosen.
- 6) Keep taking turns placing a lima bean on the numbered lily pads until they have all been filled up.
- 7) The first person will roll BOTH die. Add the die together. If the sum is equal to a lily pad where one of your markers is placed, you may move ONE square towards the fly.
- 8) The next person will repeat step six. Roll BOTH die. Add the numbers together. IF the sum is equal to a lily pad where the player's marker is placed they may move ONE square towards the fly.
- 9) Repeat until one player has moved all their lima beans to the other side and has caught all their flies.

Is this game fair? _____

























How would you change the rules?

Grade 3 DMactivity024 covers:

D9:conduct simple probability experiments (eg. rolling a number cube, spinning a spinner) and predict the results

D10:apply the concept of likelihood to events in solving simple problems

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



Data Management & Probability

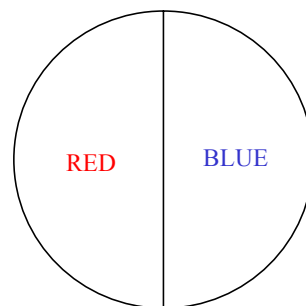
Activity TWENTY-FIVE

**** Do an example probability experiment with the spinners at the carpet. You will need to have one base and one labelled CD for each student (see materials box for building instructions). ****

Merlin wants us to do a probability experiment with a spinner. He has left us a spinner with a top that looks like the picture on the right.
Spin the spinner 30 times and record your results in the tally chart below.

My Prediction

I think the spinner will land more often on the colour:



Colour	Tally
RED	
BLUE	

Complete the following questions:

- 1) What colour did the spinner land on the most? _____
- 2) Did you predict correctly? _____
- 3) Is there an equal chance of landing on the red side or the blue side? _____
- 4) Put the probability of landing on the red side into a fraction. _____
- 5) Put the probability of landing on the blue side into a fraction. _____

Grade 3 DMactivity025 covers:

D9: conduct simple probability experiments (eg. rolling a number cube, spinning a spinner) and predict the results

D11: predict the probability that an event will occur

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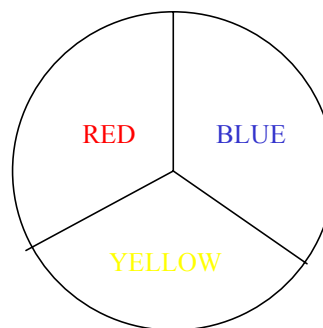
Data Management & Probability

Activity TWENTY-SIX

Merlin wants us to do a probability experiment with a spinner. He has left us a spinner with a top that looks like the picture on the right.
Spin the spinner 30 times and record your results in the tally chart below.

My Prediction

I think the spinner will land more often on the colour:



Colour	Tally
RED	
BLUE	
YELLOW	

Complete the following questions:

- 1) What colour did the spinner land on the most? _____
- 2) Did you predict correctly? _____
- 3) Is there an equal chance of landing on any colour? _____
- 4) Put the probability of landing on the red section into a fraction. _____
- 5) Put the probability of landing on the blue section into a fraction. _____
- 6) Put the probability of landing on the yellow section into a fraction. _____

Grade 3 DMactivity026 covers:

D9: conduct simple probability experiments (eg. rolling a number cube, spinning a spinner) and predict the results

D11: predict the probability that an event will occur

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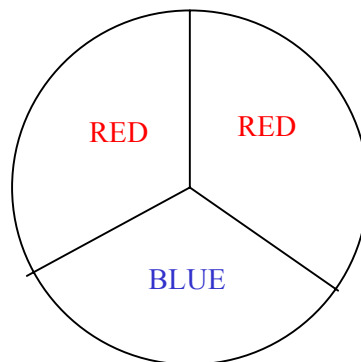
Data Management & Probability

Activity TWENTY-SEVEN

Merlin wants us to do a probability experiment with a spinner. He has left us a spinner with a top that looks like the picture on the right.
Spin the spinner 30 times and record your results in the tally chart below.

My Prediction

I think the spinner will land more often on the colour:



Colour	Tally
RED	
BLUE	

Complete the following questions:

- 1) What colour did the spinner land on the most? _____
- 2) Did you predict correctly? _____
- 3) Why did you predict that colour? _____

- 4) Is there an equal chance of landing on either red or blue? _____
- 5) Put the probability of landing on the red section into a fraction. _____
- 6) Put the probability of landing on the blue section into a fraction. _____

Grade 3 DMactivity027 covers:

D9: conduct simple probability experiments (eg. rolling a number cube, spinning a spinner) and predict the results

D11: predict the probability that an event will occur

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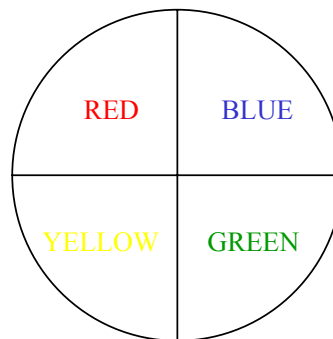
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Activity TWENTY-EIGHT

Merlin wants us to do a probability experiment with a spinner. He has left us a spinner with a top that looks like the picture on the right.
Spin the spinner 30 times and record your results in the tally chart below.

My Prediction

I think the spinner will land more often on the colour:



Colour	Tally
RED	
BLUE	
YELLOW	
GREEN	

Complete the following questions:

- 1) What colour did the spinner land on the most? _____
- 2) Is there an equal chance of landing on any colour? _____
- 3) Put the probability of landing on the red section into a fraction. _____
- 4) Put the probability of landing on the blue section into a fraction. _____
- 5) Put the probability of landing on the yellow section into a fraction. _____
- 6) Put the probability of landing on the green section into a fraction. _____

Grade 3 DMactivity028 covers:

D9: conduct simple probability experiments (eg. rolling a number cube, spinning a spinner) and predict the results

D11: predict the probability that an event will occur

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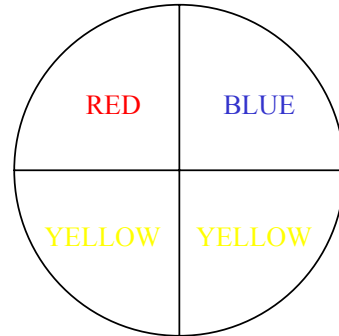
Activity TWENTY-NINE



Merlin wants us to do a probability experiment with a spinner. He has left us a spinner with a top that looks like the picture on the right.
Spin the spinner 30 times and record your results in the tally chart below.

My Prediction

I think the spinner will land more often on the colour:



Colour	Tally
RED	
BLUE	
YELLOW	

Complete the following questions:

- 1) What colour did the spinner land on the most? _____
- 2) Did you predict correctly? _____
- 3) Why did you predict that colour? _____

- 4) Is there an equal chance of landing on any colour? _____
- 5) Put the probability of landing on the red section into a fraction. _____
- 6) Put the probability of landing on the blue section into a fraction. _____
- 7) Put the probability of landing on the yellow section into a fraction. _____

Grade 3 DMactivity029 covers:

D9: conduct simple probability experiments (eg. rolling a number cube, spinning a spinner) and predict the results

D11: predict the probability that an event will occur

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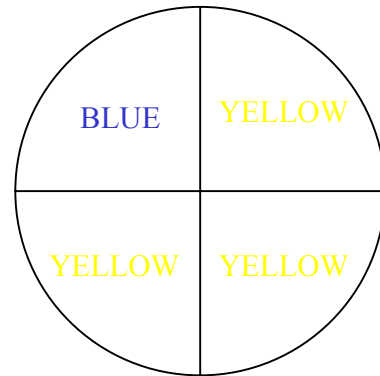
Activity THIRTY



Merlin wants us to do a probability experiment with a spinner. He has left us a spinner with a top that looks like the picture on the right. Spin the spinner 30 times and record your results in the tally chart below.

My Prediction

I think the spinner will land more often on the colour:



Colour	Tally
RED	
YELLOW	

Complete the following questions:

1) What colour did the spinner land on the most? _____

2) Did you predict correctly? _____

3) Why did you predict that colour? _____

4) Is there an equal chance of landing on either colour? _____

5) Put the probability of landing on the red section into a fraction. _____

6) Put the probability of landing on the yellow section into a fraction. _____

Grade 3 DMactivity030 covers:

D9: conduct simple probability experiments (eg. rolling a number cube, spinning a spinner) and predict the results

D11: predict the probability that an event will occur

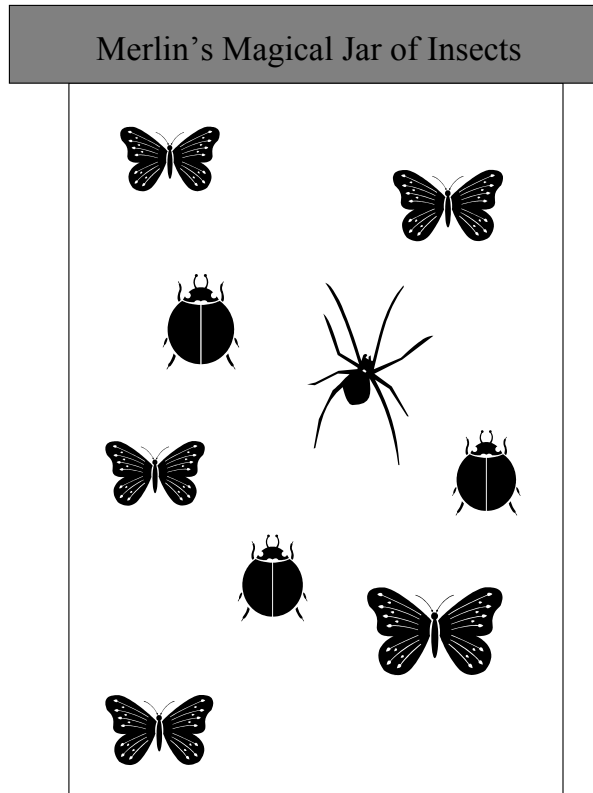
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Activity THIRTY-ONE



**** Do an example magical jar probability experiment at the carpet.****



Using the words “POSSIBLE” or “IMPOSSIBLE,” describe the possibility of pulling out each of the following insects from Merlin’s Magical Jar of Insects.

What is the probability of pulling out a butterfly? _____

What is the probability of pulling out a ladybug? _____

What is the probability of pulling out a spider? _____

Grade 3 DMactivity031 covers:

D9:conduct simple probability experiments (eg. rolling a number cube, spinning a spinner) and predict the results

D10: apply the concept of likelihood to events in solving simple problems

D12:use mathematical language (eg. possible, impossible) in discussion to describe probability

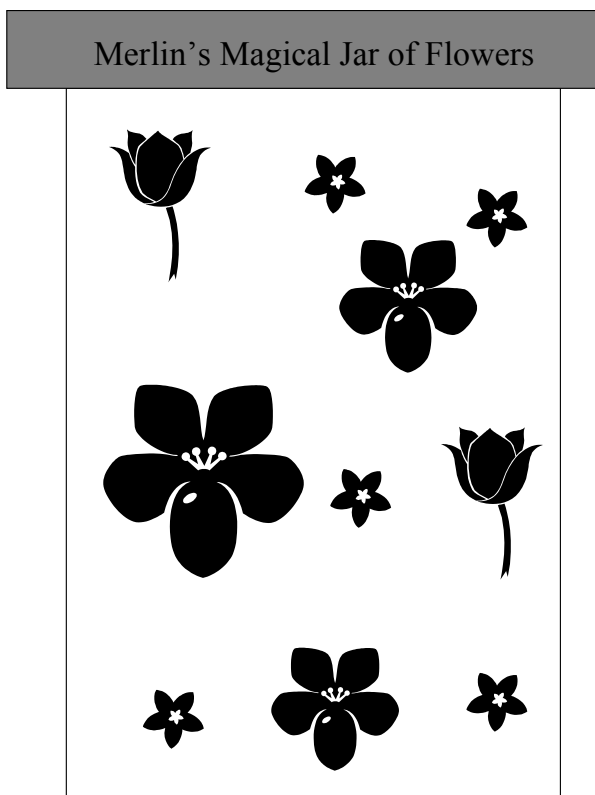
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Activity THIRTY-TWO



**** Do an example magical jar probability experiment at the carpet.****



Using the words “POSSIBLE” or “IMPOSSIBLE,” describe the possibility of pulling out each of the following flowers from Merlin’s Magical Jar of flowers.

forget-me not 	lily pad 	lily 	tulip 

What is the probability of pulling out a tulip? _____

What is the probability of pulling out a lily pad? _____

What is the probability of pulling out a forget-me-not? _____

Grade 3 DMactivity031 covers:

D9:conduct simple probability experiments (eg. rolling a number cube, spinning a spinner) and predict the results

D10: apply the concept of likelihood to events in solving simple problems

D12:use mathematical language (eg. possible, impossible) in discussion to describe probability

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Activity THIRTY-THREE



**** Pick any three different kinds of objects for this activity (example: erasers, pencils, markers) and have a ratio of 6:3:1 in the bag. ****

Merlin is up to his usual bag of tricks. In fact, he has TEN tricks in his bag. As a class, let's pull out one object at a time to see what tricks Merlin has and then place it back into the bag. Record what tricks we pulled out in the chart below:

1	2	3	4	5
---	---	---	---	---

From the data above, draw the TEN tricks you think Merlin has in his bag.

My Prediction of Tricks in Merlin's Bag

1	2	3	4	5
6	7	8	9	10

What makes you think this?

As a class, let's pull out all of the objects in Merlin's bag and record it in the chart below:

The Tricks in Merlin's Bag

1	2	3	4	5
6	7	8	9	10

How did your prediction compare with what was really in Merlin's bag?

What would be the most likely object to be pulled out? _____

Why?

What would be the least likely object to be pulled out? _____

Why?

Grade 3 DMactivity033 covers:

D9: conduct simple probability experiments (eg. rolling a number cube, spinning a spinner) and predict the results

D10: apply the concept of likelihood to events in solving simple problems

D12: use mathematical language (eg. possible, impossible) in discussion to describe probability

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Activity THIRTY-FOUR



**** Pick any three different kinds of objects for this activity (example: erasers, pencils, markers) and have a ratio of 4:4:2 in the bag. ****

Merlin is up to his usual bag of tricks. In fact, he has TEN tricks in his bag. As a class, let's pull out one object at a time to see what tricks Merlin has and then place it back into the bag. Record what tricks we pulled out in the chart below:

1	2	3	4	5
---	---	---	---	---

From the data above, draw the TEN tricks you think Merlin has in his bag.

My Prediction of Tricks in Merlin's Bag

1	2	3	4	5
6	7	8	9	10

What makes you think this?

As a class, let's pull out all of the objects in Merlin's bag and record it in the chart below:

The Tricks in Merlin's Bag

1	2	3	4	5
6	7	8	9	10

How did your prediction compare with what was really in Merlin's bag?

What would be the most likely object to be pulled out? _____

Why?

What would be the least likely object to be pulled out? _____

Why?

Merlin has a Problem!

Gweneth has a dish of red and green jelly beans. Suppose Merlin closes his eyes and takes three jelly beans. How many different combinations of jelly bean colours (in any order) could he take?

Explain your answer:

Grade 3 DMactivity034 covers:

D9: conduct simple probability experiments (eg. rolling a number cube, spinning a spinner) and predict the results

D10: apply the concept of likelihood to events in solving simple problems

D12: use mathematical language (eg. possible, impossible) in discussion to describe probability

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