Grade 3 Data Management & Probability

Name:_____________
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.
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;
- 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?

<table>
<thead>
<tr>
<th></th>
<th>eraser</th>
<th></th>
<th>scissors</th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>7</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>6</td>
<td></td>
<td></td>
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<tr>
<td>5</td>
<td></td>
<td></td>
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<tr>
<td>4</td>
<td></td>
<td></td>
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<tr>
<td>3</td>
<td></td>
<td></td>
<td></td>
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</tr>
<tr>
<td>2</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>1</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
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) __________________________________________________________________________
What does the graph “Provincial population densities” communicate?
1) ________________________________________________________________
2) ________________________________________________________________
3) ________________________________________________________________
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?
__________________________________________________________________
__________________________________________________________________
__________________________________________________________________

Grade 3 DMactivity002 covers:
D8: interpret data from graphs (eg. bar graphs, pictographs, and circle graphs)
© Math Wizards, 2003
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.

<table>
<thead>
<tr>
<th>Tulips</th>
<th>Daffodils</th>
<th>Crocuses</th>
<th>Hyacinths</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

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)
© Math Wizards, 2003
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.

<p>| | | | |</p>
<table>
<thead>
<tr>
<th></th>
<th></th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>Red</td>
<td>Yellow</td>
<td>Green</td>
<td>Brown</td>
</tr>
<tr>
<td>4</td>
<td>7</td>
<td>3</td>
<td>9</td>
</tr>
</tbody>
</table>

What colour does Merlin have the most of?  
__________________________________________________________________
What 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 (e.g. bar graphs, pictographs, and circle graphs)  
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Data Management & Probability
Activity FIVE

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:
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)
© Math Wizards, 2003
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?

<table>
<thead>
<tr>
<th>Lady bug</th>
<th>Earthworm</th>
<th>Bee</th>
</tr>
</thead>
<tbody>
<tr>
<td>70</td>
<td></td>
<td></td>
</tr>
<tr>
<td>60</td>
<td></td>
<td></td>
</tr>
<tr>
<td>50</td>
<td></td>
<td></td>
</tr>
<tr>
<td>40</td>
<td></td>
<td></td>
</tr>
<tr>
<td>30</td>
<td></td>
<td></td>
</tr>
<tr>
<td>20</td>
<td></td>
<td></td>
</tr>
<tr>
<td>10</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
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)
© Math Wizards, 2003
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?

<table>
<thead>
<tr>
<th></th>
<th>oak</th>
<th>maple</th>
<th>elm</th>
<th>willow</th>
</tr>
</thead>
<tbody>
<tr>
<td>35</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>30</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>25</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>20</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>15</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>10</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>5</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
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!

<table>
<thead>
<tr>
<th>Oak</th>
<th>Maple</th>
<th>Elm</th>
<th>Willow</th>
</tr>
</thead>
<tbody>
<tr>
<td>45</td>
<td>60</td>
<td>30</td>
<td>25</td>
</tr>
</tbody>
</table>

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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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.

<table>
<thead>
<tr>
<th>Chocolate</th>
<th>Vanilla</th>
<th>Strawberry</th>
<th>Other</th>
</tr>
</thead>
<tbody>
<tr>
<td>110</td>
<td>90</td>
<td>60</td>
<td>20</td>
</tr>
</tbody>
</table>

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 (e.g. bar graphs, pictographs, and circle graphs)
© Math Wizards, 2003
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.

<table>
<thead>
<tr>
<th>Dragon Type</th>
<th>Representation</th>
</tr>
</thead>
<tbody>
<tr>
<td>green dragons</td>
<td>![Green Dragons]</td>
</tr>
<tr>
<td>red dragons</td>
<td>![Red Dragons]</td>
</tr>
<tr>
<td>blue dragons</td>
<td>![Blue Dragons]</td>
</tr>
<tr>
<td>black dragons</td>
<td>![Black Dragons]</td>
</tr>
</tbody>
</table>

 ocas = 10 dragons

What is the definition of census?

__________________________________________________________________
__________________________________________________________________
__________________________________________________________________

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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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?

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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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.

<table>
<thead>
<tr>
<th>Planets</th>
<th>Stars</th>
<th>Moons</th>
<th>Comets</th>
</tr>
</thead>
<tbody>
<tr>
<td>100</td>
<td>950</td>
<td>200</td>
<td>300</td>
</tr>
</tbody>
</table>

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)
© Math Wizards, 2003
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.

<table>
<thead>
<tr>
<th>Purple</th>
<th>Green</th>
<th>Blue</th>
<th>Orange</th>
</tr>
</thead>
<tbody>
<tr>
<td>35</td>
<td>20</td>
<td>5</td>
<td>15</td>
</tr>
</tbody>
</table>

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)
© Math Wizards, 2003
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.

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.

<p>| | | | | |</p>
<table>
<thead>
<tr>
<th></th>
<th></th>
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<th></th>
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</thead>
<tbody>
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<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
Step THREE:

Graph your data using the chart paper below.

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:

<table>
<thead>
<tr>
<th>Criteria</th>
<th>Level 1</th>
<th>Level 2</th>
<th>Level 3</th>
<th>Level 4</th>
</tr>
</thead>
<tbody>
<tr>
<td>Understanding of concepts</td>
<td>• A question with finite answers was chosen</td>
<td>• A question with finite answers was chosen</td>
<td>• An appropriate question with finite answers was chosen</td>
<td>• A question with significance to daily classroom life was posed</td>
</tr>
<tr>
<td></td>
<td>• Transfer of data from tally chart to graph was incomplete</td>
<td>• Tally data was transferred to the graph</td>
<td>• Tally data was transferred to the graph effectively</td>
<td>• Tally data was transferred to the graph effectively, and helped communicate the survey results to the audience</td>
</tr>
<tr>
<td>Communication of required knowledge</td>
<td>• Survey results are explained, however, are incomplete</td>
<td>• Survey results are explained</td>
<td>• Survey results, importance of survey and implications for the classroom were clearly explained</td>
<td>• The survey conducted was clearly explained</td>
</tr>
<tr>
<td></td>
<td>• Importance or applicability are limited</td>
<td>• Importance or applicability are limited</td>
<td></td>
<td>• Results are enlightening and implementable</td>
</tr>
</tbody>
</table>

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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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: ______________________________________________________
_________________________________________________________________

<table>
<thead>
<tr>
<th>Choices</th>
<th></th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Tally Chart

<table>
<thead>
<tr>
<th>Choices</th>
<th></th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Question 2: ______________________________________________________
_________________________________________________________________

<table>
<thead>
<tr>
<th>Choices</th>
<th></th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Tally Chart

<table>
<thead>
<tr>
<th>Choices</th>
<th></th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

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 spreadsheet program.

Step SIX:

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

What two conveniences did the spreadsheet 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)
© Math Wizards, 2003
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) ________________________________________________________________
________________________________________________________________

Grade 3 DMactivity016 covers:
D8: interpret data from graphs (eg. bar graphs, pictographs, and circle graphs)
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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.

<table>
<thead>
<tr>
<th>1993</th>
<th>1991</th>
</tr>
</thead>
<tbody>
<tr>
<td>1919</td>
<td>9191</td>
</tr>
</tbody>
</table>

Circle the number that doesn’t belong.

Explain why it doesn’t belong in the spell.

__________________________________________________________________
__________________________________________________________________
__________________________________________________________________
__________________________________________________________________
__________________________________________________________________
__________________________________________________________________
__________________________________________________________________

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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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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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

________________________________________________________________________
________________________________________________________________________
________________________________________________________________________
________________________________________________________________________
________________________________________________________________________
________________________________________________________________________
________________________________________________________________________

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
© Math Wizards, 2003
Help Merlin sort the two-dimensional shapes into a DOUBLE Venn diagram.
Data Management & Probability
Activity TWENTY-ONE

Help Merlin sort the snowmen into a TRIPLE Venn diagram.
Today we are going to start studying probability. What is the definition of probability?

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 different tail pictures. All Canadian nickels have beavers.

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

**Probability Experiment ONE**

PREDICT which side you think is luckier? Circle one.

<table>
<thead>
<tr>
<th>Heads</th>
<th>Tails</th>
</tr>
</thead>
</table>

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

<table>
<thead>
<tr>
<th></th>
<th>Tally Marks</th>
<th>Total</th>
</tr>
</thead>
<tbody>
<tr>
<td>Heads</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Tails</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

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.

<table>
<thead>
<tr>
<th>Tally Marks</th>
<th>Total</th>
</tr>
</thead>
<tbody>
<tr>
<td>Heads</td>
<td></td>
</tr>
<tr>
<td>Tails</td>
<td></td>
</tr>
</tbody>
</table>

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.

<table>
<thead>
<tr>
<th>Tally Marks</th>
<th>Total</th>
</tr>
</thead>
<tbody>
<tr>
<td>Heads</td>
<td></td>
</tr>
<tr>
<td>Tails</td>
<td></td>
</tr>
</tbody>
</table>

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:
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.

<table>
<thead>
<tr>
<th>Die</th>
<th>Tally Marks</th>
<th>Total</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td></td>
<td></td>
</tr>
<tr>
<td>2</td>
<td></td>
<td></td>
</tr>
<tr>
<td>3</td>
<td></td>
<td></td>
</tr>
<tr>
<td>4</td>
<td></td>
<td></td>
</tr>
<tr>
<td>5</td>
<td></td>
<td></td>
</tr>
<tr>
<td>6</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

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.

<table>
<thead>
<tr>
<th>Die</th>
<th>Tally Marks</th>
<th>Total</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td></td>
<td></td>
</tr>
<tr>
<td>2</td>
<td></td>
<td></td>
</tr>
<tr>
<td>3</td>
<td></td>
<td></td>
</tr>
<tr>
<td>4</td>
<td></td>
<td></td>
</tr>
<tr>
<td>5</td>
<td></td>
<td></td>
</tr>
<tr>
<td>6</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

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.

<table>
<thead>
<tr>
<th>Die</th>
<th>Tally Marks</th>
<th>Total</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td></td>
<td></td>
</tr>
<tr>
<td>2</td>
<td></td>
<td></td>
</tr>
<tr>
<td>3</td>
<td></td>
<td></td>
</tr>
<tr>
<td>4</td>
<td></td>
<td></td>
</tr>
<tr>
<td>5</td>
<td></td>
<td></td>
</tr>
<tr>
<td>6</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

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.

<table>
<thead>
<tr>
<th>Die</th>
<th>1</th>
<th>2</th>
<th>3</th>
<th>4</th>
<th>5</th>
<th>6</th>
</tr>
</thead>
<tbody>
<tr>
<td>Altogether</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

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
© Math Wizards, 2003
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
© Math Wizards, 2003
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:

______________________________

<table>
<thead>
<tr>
<th>Colour</th>
<th>Tally</th>
</tr>
</thead>
<tbody>
<tr>
<td>RED</td>
<td></td>
</tr>
<tr>
<td>BLUE</td>
<td></td>
</tr>
</tbody>
</table>

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
© Math Wizards, 2003
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:

<table>
<thead>
<tr>
<th>Colour</th>
<th>Tally</th>
</tr>
</thead>
<tbody>
<tr>
<td>RED</td>
<td></td>
</tr>
<tr>
<td>BLUE</td>
<td></td>
</tr>
<tr>
<td>YELLOW</td>
<td></td>
</tr>
</tbody>
</table>

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
© Math Wizards, 2003
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:
__________________________________________

<table>
<thead>
<tr>
<th>Colour</th>
<th>Tally</th>
</tr>
</thead>
<tbody>
<tr>
<td>RED</td>
<td></td>
</tr>
<tr>
<td>BLUE</td>
<td></td>
</tr>
</tbody>
</table>

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
© Math Wizards, 2003
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:
__________________________________________

<table>
<thead>
<tr>
<th>Colour</th>
<th>Tally</th>
</tr>
</thead>
<tbody>
<tr>
<td>RED</td>
<td></td>
</tr>
<tr>
<td>BLUE</td>
<td></td>
</tr>
<tr>
<td>YELLOW</td>
<td></td>
</tr>
<tr>
<td>GREEN</td>
<td></td>
</tr>
</tbody>
</table>

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. __________
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:

<table>
<thead>
<tr>
<th>Colour</th>
<th>Tally</th>
</tr>
</thead>
<tbody>
<tr>
<td>RED</td>
<td></td>
</tr>
<tr>
<td>BLUE</td>
<td></td>
</tr>
<tr>
<td>YELLOW</td>
<td></td>
</tr>
</tbody>
</table>

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
© Math Wizards, 2003
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:
__________________________________________

<table>
<thead>
<tr>
<th>Colour</th>
<th>Tally</th>
</tr>
</thead>
<tbody>
<tr>
<td>RED</td>
<td></td>
</tr>
<tr>
<td>YELLOW</td>
<td></td>
</tr>
</tbody>
</table>

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
© Math Wizards, 2003
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

© Math Wizards, 2003
Using the words “POSSIBLE” or “IMPOSSIBLE,” describe the possibility of pulling out each of the following flowers from Merlin’s Magical Jar of flowers.

<table>
<thead>
<tr>
<th>forget-me not</th>
<th>lily pad</th>
<th>lily</th>
<th>flower</th>
</tr>
</thead>
</table>

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

© Math Wizards, 2003
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:

<p>| | | | | |</p>
<table>
<thead>
<tr>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
<td>5</td>
</tr>
</tbody>
</table>

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

**My Prediction of Tricks in Merlin’s Bag**

<p>| | | | | |</p>
<table>
<thead>
<tr>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
<td>5</td>
</tr>
<tr>
<td>6</td>
<td>7</td>
<td>8</td>
<td>9</td>
<td>10</td>
</tr>
</tbody>
</table>

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:

<table>
<thead>
<tr>
<th>1</th>
<th>2</th>
<th>3</th>
<th>4</th>
<th>5</th>
</tr>
</thead>
<tbody>
<tr>
<td>6</td>
<td>7</td>
<td>8</td>
<td>9</td>
<td>10</td>
</tr>
</tbody>
</table>

The Tricks in Merlin’s Bag

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  
© Math Wizards, 2003
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:

<table>
<thead>
<tr>
<th>1</th>
<th>2</th>
<th>3</th>
<th>4</th>
<th>5</th>
</tr>
</thead>
</table>

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

**My Prediction of Tricks in Merlin’s Bag**

<table>
<thead>
<tr>
<th>1</th>
<th>2</th>
<th>3</th>
<th>4</th>
<th>5</th>
</tr>
</thead>
<tbody>
<tr>
<td>6</td>
<td>7</td>
<td>8</td>
<td>9</td>
<td>10</td>
</tr>
</tbody>
</table>

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

<table>
<thead>
<tr>
<th></th>
<th>1</th>
<th>2</th>
<th>3</th>
<th>4</th>
<th>5</th>
<th>6</th>
<th>7</th>
<th>8</th>
<th>9</th>
<th>10</th>
</tr>
</thead>
</table>

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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