Fraction, Probability and Probability Outcomes

Lesson Summary	Students will use eggs and chicks to learn about fractions, probability and probability outcomes.

Major Topic and SOL

Math SOL (2009)   4.19.a, 4.19.b

Length of Unit   2 - 45 minute periods

Student Objectives

In Mathematics the student will be able to:

- Represent common fractions (1/2,1/3,1/4,1/6,1/12)
- Make connections between fractions, probability, and probability outcomes
- Apply prior knowledge of fractions
- Apply their knowledge of fractions, probability, and probability outcomes to a simple event, using concrete materials

In Language the students will be able to:

- Describe and discuss the degree of likelihood of an event occurring
- Use key vocabulary to describe outcomes and ratios
- Explain and write the probability of a simple event as a fraction, where the total number of possible outcomes is 12 or fewer.

21st Century Skills

- Critical-Thinking and Problem Solving
- Communication
- Creativity and Innovation
- Collaboration
- Information and Media Literacy
- Contextual Learning

Assessment Evidence

- Students were assessed by reviewing their homework, test and presentation of their own egg carton.

Supplies/Materials/Technology

- Egg Carton containing plastic eggs of different colors

- Marshmallow chicks and jelly beans
- Crayons and pencils
- Pre-made handouts

Lesson Plan

Motivation & Building Background:

- The teacher will ask the students if they have every wanted baby chicks.
- The teacher will ask the students to imagine that they are trying to raise a variety of breeds of chicks.
- Explain that they will be receiving a dozen eggs, but they have to do the math before they will hatch.
- The teacher will divide the class into pairs and pass out the egg carton.
  - Each student pair will be given twelve colored eggs in an egg carton
    - Each color represents a different breed of chick
- The teacher will ask the students how many breeds they will be hatching of the dozen they have received and begin discussion between the relationships of the number of breeds to the total number of eggs in their carton.

Presentation

- **Presentation: Day One**
  - The teacher will pass out a hand out with a picture of eggs. Ask the students to color the eggs on the sheet to match their own cartons. Below the carton write down how many eggs you have of each breed or color.
  - Discuss the relationship between the colored breeds and the whole, plus what the correct fraction would be to represent this. Have them to write the fraction for each colored breed on their sheet.
  - Put the words *Impossible, Unlikely, Likely,* and *Certain* on the board.
    - Discuss definitions.
  - Show a baggie with four yellow eggs in it
    - ask what the likelihood of pulling a yellow egg out of the baggie would be? Explain that if an event is *certain* it has a probability of **one**.
    - How about the chances of pulling out a purple egg? Explain that if an event is *impossible* it has the probability of **0**.
  - Next, present a baggie with four purple eggs and two yellow eggs.
    - Ask the students what color they think I will pull out and why?
  - Students are to look at their own eggs, determine outcomes, and discussed with their partner.
    - Talk about the relationship of the parts to the whole for each color breed.

- ▪ They will then write down the probability fraction for each color on their paper.
  - o Write the word probability on the board and explain that the definition is the chances of an event occurring.
  - o Write the word ratio on the board and explain that the probability of an event occurring is the ratio of desired outcomes to the total number of possible outcomes. Give and explain examples on the board.
  - o Give each student an egg and a sheet of chart paper.
  - o Students are instructed to open their egg and take out the different colored jelly beans inside.
  - o Ask students to draw their different colored jelly beans at the top of their grid.
  - o Give each pair of students a spinner with the colors marked.
    - ▪ Spin twelve times and record their results for each spin by putting a check under the appropriate color the spinner falls on.
  - o Turn your outcomes into probability fractions; red - 2/12 and so on.
    - ▪ Discuss outcomes that were written – were the results the same – discuss
  - o Recap and ask what they learned today. Close the day with the handout – (jelly bean sheet).
    - ▪ Work the first problem together and have the students complete it for homework.

- **Day two:**
  - o Check and discuss homework problems
  - o Hand out carton of eggs again
    - ▪ Different colored marshmallow chicks have been put into some (they hatched) and jelly beans in others that have not yet hatched.
  - o The teacher will ask the following questions:
    - ▪ How many of the whole have hatched – how many of the whole have not
    - ▪ How many of the whole are yellow, purple, and pink?
  - o Pass out handout where students will write and discuss the probability for picking up an egg that did not hatch and for picking up eggs that did.
  - o Continue with probability by color.
  - o Compare the ratio of jelly beans to chicks, conclude with jelly bean probability using the beans in the eggs that did not hatch

Practice/Application

- When students have completed the activity; each group creates their own carton (not having to be a dozen) and presents it to class with probability vocabulary and relationships.

O O O O O O

O O O O O O
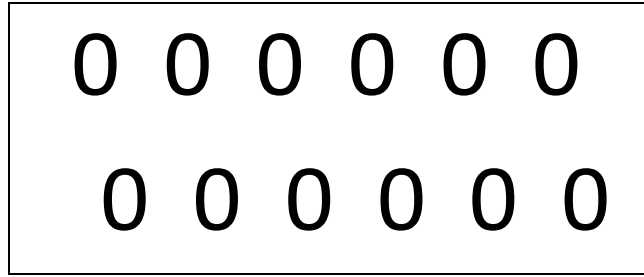
1. **Color eggs according to the colored eggs in your carton.**

2. **Make a table that tells you the number of eggs of each color.**

COLOR	NUMBER OF EGGS

3. **How many eggs are in your carton? _____**

4. **Figure the changes of picking each egg color.**
   **How many orange eggs are there? There is only one. The chance of picking an orange egg is <u>1 out of 12,</u> or <u>1/12.</u>

COLOR	CHANCES	FRACTION
orange	one out of twelve	1/12

5. **Which colored egg are you <u>*most likely*</u> to choose if you weren't looking?**
   _____

6. **Which colored egg would you be _unlikely_ choose?** _____

7. **Name a color that would be _impossible_ to choose?** _____

8. **Draw your own carton of colored eggs and then write the probability fraction for each color. It does not need to be a dozen.**

My egg carton!
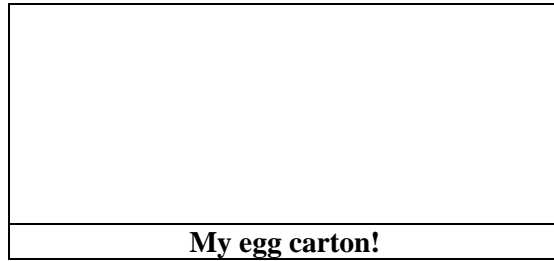
Color	**Probability Fraction**
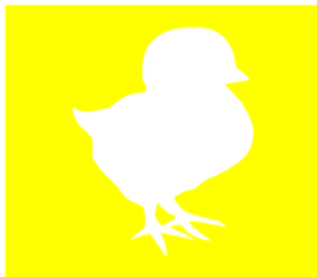
1. **How many chicks hatched out of the dozen eggs? Write as a fraction. _____**

2. **How many chicks did not hatch? Write as a fraction. _____**

3. **If you reached into your carton without looking, what is the probability you will pick a green chick?**
a. **Certain**
b. **Likely**
c. **Unlikely**
d. **Impossible**

4. **What is the probability that you will select a red chick?**
a. **Certain**
b. **Likely**
c. **Unlikely**
d. **Impossible**

5. **How many jelly beans do you have?   _____**

6. **What fraction of your jelly beans are yellow? _____**

7. **What fraction of you jelly beans are green? _____**

8. **What color jelly bean are you most likely to select if not looking? _____**

9. **What fraction of your chicks are purple?**

10. **What fraction of you chicks are blue?**

11. **Take out all your unhatched eggs. Complete the following probability chart using your hatch chicks. Write the probability of selecting each chick breed.**

Breed Color	Probability Faction
Green	
Blue	
Orange	
Yellow	
Pink	
Purple	

Create a bar graph of your eggs.
Make sure to give it a title!