![iSENSE]

Single Draw with Replacement Probability with Two Distributions

Purpose

1. Determine the quantity of each color of object in the container.
2. See that experimental probability approaches theoretical probability when a sufficient number of experiments are conducted.
3. Use iSENSE to visualize and explore this effect.

Materials

1. One of two colored bags containing 12 objects: yellow, red, blue
2. Computer or tablet with internet connection
3. Interactive website – isenseproject.org

Method

1. Work in groups of two.
2. **Without looking in the container**, Student 1 selects one object from the container and note its color with a tally mark in Table 1. Place the object back into the container.
3. **Without looking in the container**, Student 2 selects one object from the container and note its color with a tally mark in Table 1. Place the object back into the container.
4. Students 1 and 2 take turns repeating steps 2 and 3 until each has tallied six outcomes, for a total of 12 outcomes.

|	Red	Blue	Yellow
Student 1			
Student 2			
Total			

Table 1

5. Given that there are 12 objects in the container, calculate how many there are of each color, based only on your experimental probability.

6. Enter your *Totals* from Table 1 into iSENSE:
   - Go to isenseproject.org
   - Login as directed by your teacher.
   - Click on *Project*.
   - Search for *Single Draw with Replacement Probability with Two Distributions* or *707*.
   - Click on *Manual Entry* under *Contribute Data*.
   - Enter a data set name (e.g. partners' first names).
   - Enter data. Use "Add Row" as necessary. Then click *Save*.

iSENSE Analysis

1. Verify correct input of your data in *Table*.
2. Use the *Bar* chart to examine your data.
3. Add data contributed by other participants and visualize using *Bar* chart or *Histogram*.
4. Save any visualization that you find particularly interesting.
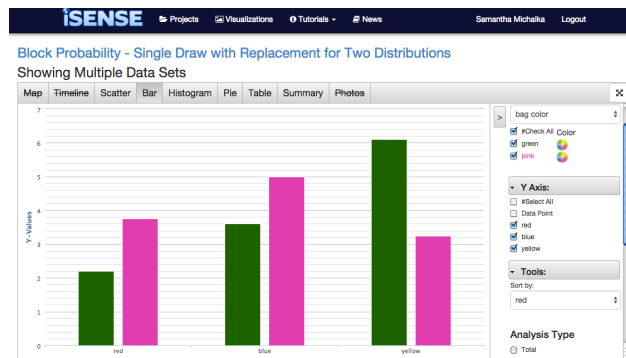
Discussion Questions

1. If we examine the experimental data from the entire class for your bag color, does the experimental probability change? How?
2. What conclusion can you infer given your answers from your calculation in Method Step 5 and Question 1?
3. How do the distributions of objects vary across the two bag colors?
4. What questions might you investigate if you were to repeat this experiment?