Lesson Plan Template
# Independent and Dependent Probability

Grade Level	6th
Subject	Mathematics
Curriculum Objective	4.01 – Develop fluency with counting strategies to determine the sample space for an event. Include lists, tree diagrams, frequency distribution tables, permutations, combinations, and the Fundamental Counting Principle.
Guiding Question	How do I find the probability of independent and dependent events?
Lesson Summary	The students must understand basic fractions, and how to multiply them, in order to be successful with this activity. The students have written questions within this Smart Board activity. A visual aid of a 'bag of marbles" has been added. The students will move the objects as they work the problem.
Activating Strategy	Complete the two practice problems on the Smart Board as a review. Have the students complete each step after you demonstrate it, to check for understanding.
Cognitive Strategy	Have the students go to Students on Piney (or where ever you have the file saved) and pull up <u>Independent and Dependent Practice.</u> Have them add their name after the dash in the file name, and save it to their own file. Read the written problem. Drag the marbles or cards, with your finger on the Smart Board or a mouse at the computer, to match the drawn marbles or cards in the problem. For instance, in the practice problem, there are 13 total marbles. The problem asks for the theoretical probability of pulling 3 pink marbles out in a row with out replacement. Make a fraction bar. Count the marbles as a class. That number is your denominator. Count the pink marbles. That number is your numerator. Drag a marble from the bag (circle.) Drag the pink marble back into the bag, because the problem says they are returned (replacement.) Then, repeat these steps two more times. Multiply the fractions together. For practice problem number two, do the same thing, but leave the marbles out as you draw them. So, instead of 4/13 x 4/13 x 4/13; it would be 4/13 x 3/12 x 2/11. Your numerator and denominator get smaller because there is one less marble in the bag to count as you start each step. Have the students complete the next one their own. Check as a group. Let them do one more and check. If the students are ready for independent work, have them finish the problems at their seats. They can either work do the math on the page with the key pad, or pencil and paper. Have them save their work again when they are finished. Go to print; then go to the thumbnail drop down box and choose small. Then, click print again. Staple all written work to this. If you don't have access to a lab with the Smart Board installed on

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	each computer, print the questions out, have the students do them at their desk, and ask for volunteers to do the problems at the board.
Summarizing Strategy	Students will ask questions during the practice problems. Then, use Vision Software to monitor students' independent work. If Visions Software is not available, spot check while walking around the room. Student's final product will also be available for evaluation.
Evaluation	The students will print their work, staple any written work to it, and then, the instructor will go over the problems verbally. The students will check their own work with pen, while asking any remaining questions about the problems.
Resources	A computer lab, set up with Smart Board software installed, or a Smart Board. Vision Software (optional) Hands-on Probability saved to Students on Piney

Practice Problem 1

There are 5 yellow, 4 pink, and 4 violet marbles in a hat. You pick 3 marbles from the hat. The marbles are returned to the hat after they are drawn.
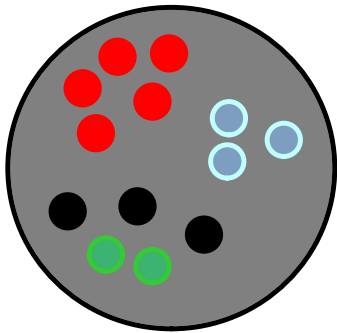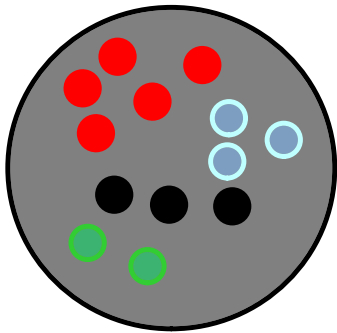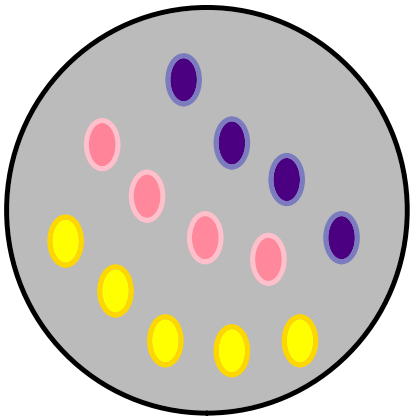P(three pink marbles in a row)
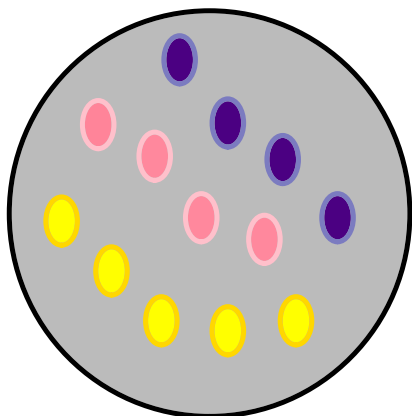
Practice Problem 2

There are 5 yellow, 4 pink, and 4 violet marbles in a hat. You pick 3 marbles from the hat. The marbles are not returned to the hat after they are drawn.
P(three pink marbles in a row)
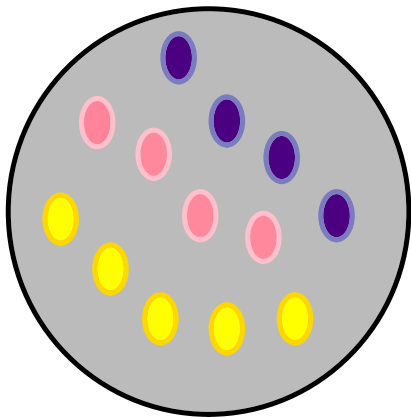
There are 3 black, 5 red, 2 green, and 3 blue marbles in a hat. You pick
2 marbles from the hat without replacement.
P(red, not red)

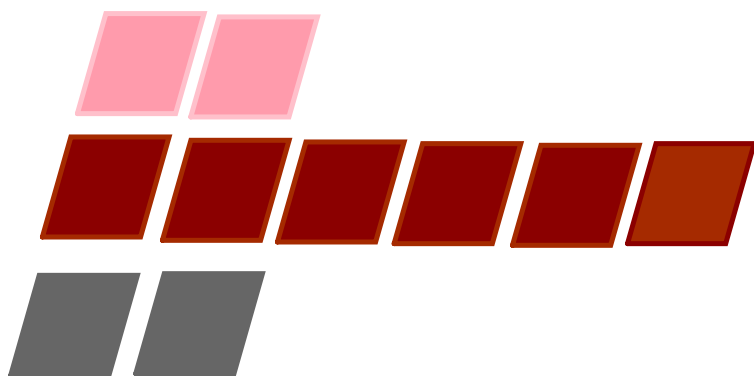There are 3 black, 5 red, 2 green, and 3 blue marbles in a hat. You pick
 2 marbles from the hat with replacement.
P(red, not red)

There are 5 yellow, 4 pink, and 4 violet marbles in a hat. You pick 3 marbles from the hat. The marbles are returned to the hat after they are drawn.
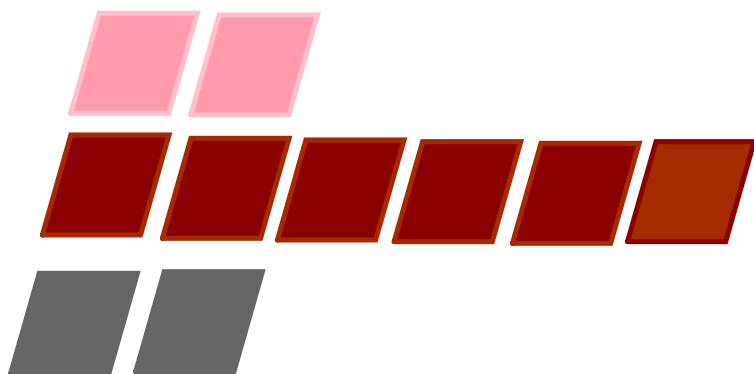P(three white marbles in a row)

There are 5 yellow, 4 pink, and 4 violet marbles in a hat. You pick 3 marbles from the hat. The marbles are not returned to the hat after they are drawn. P(white, white, white)
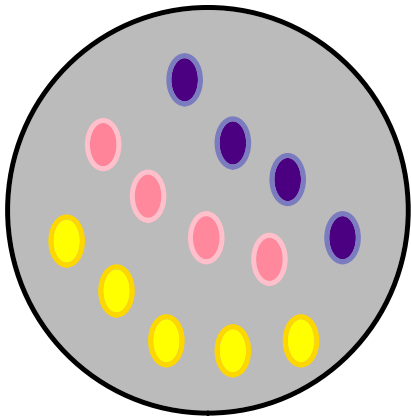
A deck of cards has 2 pink, 6 brown, and 2 gray cards. You pick 2 cards from the deck. The cards are returened to the deck after they are picked.
P(gray, pink)

A deck of cards has 2 pink, 6 brown, and 2 gray cards. You pick 2 cards from the deck. The cards are not returened to the ddeck after they are picked. P(gray, pink)

A deck of cards has 2 red, 6 purple, 5 gray, 4 yellow, and 4 violet cards. You draw 2 from the deck. Cards are returened to the deck after they are drawn. P(red,red)

A deck of cards has 2 red, 6 purple, 5 gray, 4 yellow, and 4 violet cards. You draw 2 from the deck. Cards are not returened to the deck after they are drawn. P(red,red)

There are 4 purple, 4 navy, and 4 red marbles in a hat. You pick 3 marbles from
 the hat. Marbles are returned to the hat after they have been drawn.
P(navy, navy, navy)
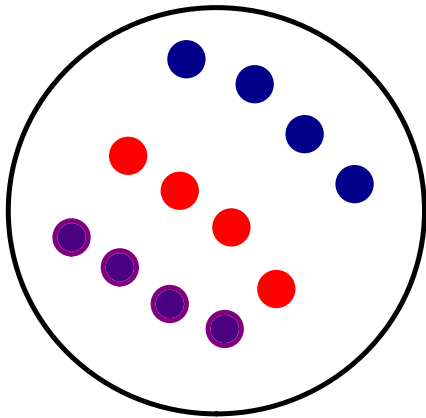
There are 4 purple, 4 navy, and 4 red marbles in a hat. You pick 3 marbles from the hat. Marbles are not returned to the hat after they have been drawn.

P(navy, navy, navy)
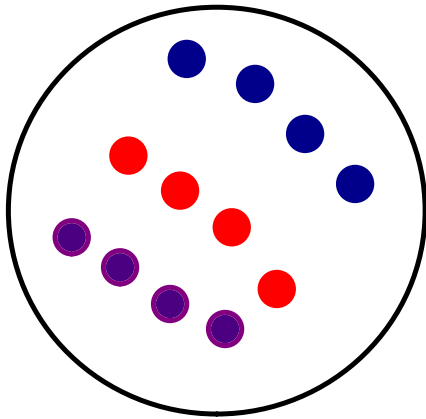
There are 5 navy, 5 blue, and 6 gray marbles in a hat. You pick 2 marbles
from the hat. Marbles ar returened after they have been drawn.
P(blue, blue)
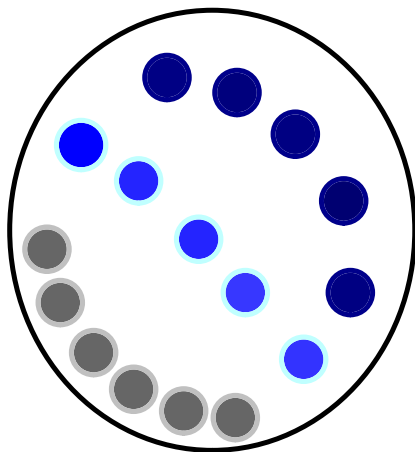
There are 5 navy, 5 blue, and 6 gray marbles in a hat. You pick 2 marbles from the hat. Marbles are not returened after they have been drawn.
P(blue, blue)
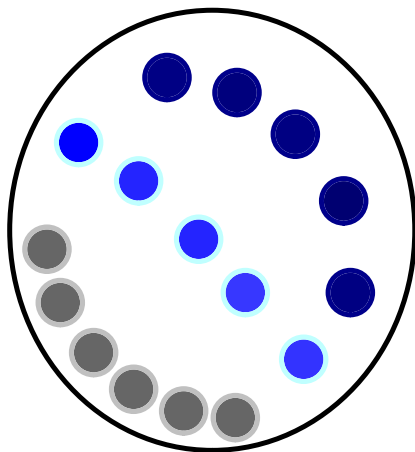
A deck of cards has 4 black, 6 green, and 4 gray cards. You pick 3 cards from the deck. You return the cards to the deck after they have been drawn. P(green, green, green)

A deck of cards has 4 black, 6 green, and 4 gray cards. You pick 3 cards
from the deck. You do not return the cards to the deck after they have been drawn.
P(green, green, green)

A deck of cards has 5 violet, 5 gray, and 4 red cards. You pick 3 cards from the deck. Drawn cards are returned to the deck after each draw.
P(red, gray, violet)
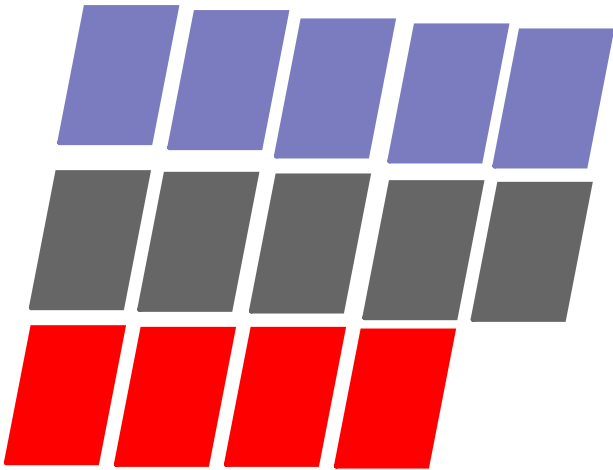
A deck of cards has 5 violet, 5 gray, and 4 red cards. You pick 3 cards from the deck. Drawn cards are not returned to the deck.
P(red, gray, violet)