7.SP.C

Investigate chance processes and develop, use, and evaluate probability models.

1. Select **all** statements that describe a likely event.

A. The observed probability a car turns right at a certain intersection is 53%.

B. The observed probability a person has a drink with their lunch is 0.85.

C. The observed probability that a random word on a page contains a vowel is $\frac{49}{50}$.

D. The probability a prime number is rolled on a 10-sided polyhedron is 40%.

E. The probability a random key pressed on a certain keyboard is the “Y” key is 0.95%.

1. The line plot shows the number of minutes early (negative values) or late (positive values) the trains at a certain station were for 1 week.



Based on these results, what is the expected probability a train was 5 or more minutes late?
2. A marble is pulled at random from a bag, the color is noted, and then the marble is put back into the bag. The probability a green marble is pulled each time, using this process, is 0.55. Based on this outcome, which interval is the **best** prediction for the number of times a green marble is expected to be pulled if this process is repeated 200 times?

A. 5 to 6
B. 50 to 60
C. 100 to 120
D. 140 to 150
3. Assume that a baby being born a boy is as equally likely as a baby being born a girl. Describe a model that could be used to predict the probability that a random family with 3 children has
3 girls and 0 boys.

7.SP.C

Investigate chance processes and develop, use, and evaluate probability models.

1. Mrs. Thames is organizing art supplies for a class project. Each student will get one crayon, one marker, and one pair of scissors. The colors of the crayons and markers and the type of scissors are given below.

**Crayons:** Red, Blue, Yellow, Green
**Markers:** Black, Blue, Brown
**Scissors:** Metal, Plastic

*a.* Create an organized list, table, or tree diagram to represent all possible outcomes of randomly selecting one crayon, one marker, and one pair of scissors.

*b.* Use your answer to part *a* to determine the probability that a random set of art supplies will have both a blue crayon and a blue marker.

1. A stack of pieces of construction paper contains red, brown, blue, and black paper. The probability a randomly-selected piece of paper is red is 0.35. The probability a randomly-selected piece of paper is brown is 15%. The probability a randomly-selected piece of paper is blue is$\frac{1}{5}$. What is the probability a randomly-selected piece of paper is black?
2. A traffic light is either red, yellow, or green. The probability that the light is yellow is the smallest. The probability that the light is red is slightly less than the probability that the light is green. Describe a model that could be used to predict the probability that the light will be green at 8 a.m. tomorrow morning.
3. Donna and Francis are playing a game. In the game, one player selects Number Cube A, B, C, or D, then the other player selects a different number cube. Both players roll their number cubes and the player with the higher number showing on the number cube is the winner. The numbers on the six faces of each number cube are shown below.

Number Cube A: 7, 10, 14, 15, 19, 22
Number Cube B: 3, 6, 8, 9, 20, 24
Number Cube C: 1, 11, 12, 16, 17, 21
Number Cube D: 2, 4, 5, 13, 18, 23

*a.* Which number cube should the first player choose to have the best probability of winning?

*b.* When the first player chooses the number cube you determined in part *a*, which number cube should the second player choose to have the best chance to win?

**Teacher Material**

7.SP.C

Investigate chance processes and develop, use, and evaluate probability models.

| **Question** | **Claim** | **Key/Suggested Rubric** |
| --- | --- | --- |
| 1[[1]](#footnote-1) | 1 | **1 point:** Selects B and C |
| 2[[2]](#footnote-2) | 1 | **1 point:**$ \frac{6}{30}$, or equivalent |
| 32 | 1 | **1 point:** Selects C |
| 41 | 4 | **1 point:** Answers will vary. Example: On a fair coin, assign “Heads” to “Girl” and “Tails” to “Boy.” Flip the coin 3 times. A result of “Heads, Heads, Heads” responds to a family with 3 children having all 3 girls. |
| 5[[3]](#footnote-3) | 1 | **2 points:** Represents all possible outcomes AND $\frac{2}{24}$, or equivalent.Example representation:

| **Crayon** | **Marker** | **Scissor** |
| --- | --- | --- |
| Red | Black | Metal |
| Red | Blue | Metal |
| Red | Brown | Metal |
| Blue | Black | Metal |
| Blue | Blue | Metal |
| Blue | Brown | Metal |
| Yellow | Black | Metal |
| Yellow | Blue | Metal |
| Yellow | Brown | Metal |
| Green | Black | Metal |
| Green | Blue | Metal |
| Green | Brown | Metal |
| Red | Black | Plastic |
| Red | Blue | Plastic |
| Red | Brown | Plastic |
| Blue | Black | Plastic |
| Blue | Blue | Plastic |
| Blue | Brown | Plastic |
| Yellow | Black | Plastic |
| Yellow | Blue | Plastic |
| Yellow | Brown | Plastic |
| Green | Black | Plastic |
| Green | Blue | Plastic |
| Green | Brown | Plastic |

**1 point:** Represents all possible outcomes OR $\frac{2}{24}$, or equivalent. |
| 63 | 1 | **1 point:** 30%, or equivalent |
| 73 | 4 | **1 point:** Answers will vary. Example: Draw a circular spinner. Divide the spinner in half. On one half of the spinner, label that section “Green.” Divide the other half into two parts, making one part about 1/10 of the whole circle. Label that smaller, 1/10 part of the circle, “Yellow” and label the last section “Red.” Spin the arrow on the spinner to represent the color of the light at 8 a.m. tomorrow morning. |
| 8[[4]](#footnote-4) | 4 | **1 point:** Number Cube A AND number Cube C |

1. Adapted from the Mathematics K–12 Learning Standards. Internet. Available from <http://www.k12.wa.us/Mathematics/Standards.aspx>; accessed 11/2015. [↑](#footnote-ref-1)
2. Adapted from Smarterbalanced.org. Grade 7, Claim 1, Target I Item Specifications. Internet. Available from <http://www.smarterbalanced.org/smarter-balanced-assessments/>; accessed 11/2015. [↑](#footnote-ref-2)
3. Adapted from the Mathematics K–12 Learning Standards. Internet. Available from <http://www.k12.wa.us/Mathematics/Standards.aspx>; accessed 11/2015. [↑](#footnote-ref-3)
4. <https://www.illustrativemathematics.org/content-standards/7/SP/C/8/tasks/1442>, accessed on 11/2015, is licensed by [Illustrative Mathematics](https://www.illustrativemathematics.org/) under [CC BY-NC-SA 4.0](http://creativecommons.org/licenses/by-nc-sa/4.0/) [↑](#footnote-ref-4)