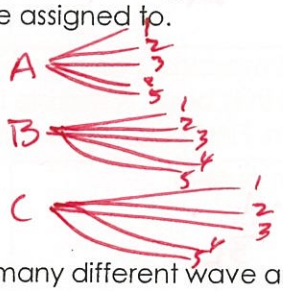
Name: Key	Date:
Topic:	Class:

Main Ideas/Questions	Notes/Examples

Warm-Up

Race Starting Line Assignments	
Waves	A, B, C
Corrals	1, 2, 3, 4, 5

A marathon has three scattered starting times, each called a "wave". Each wave then has five starting areas, called "corrals", that runners are grouped into. Draw a tree diagram that shows the possible waves and corrals a runner could be assigned to.



a) How many different wave and corral assignments are there? 15

b) If waves and corrals are randomly assigned, find P(wave B, corral 5): $\frac{1}{15}$

Compound Events

one in which there is more than one possible outcome

Independent Events

- In independent events, the outcome of one event **does not affect** the outcome of the other event.
- The probability of two independent events is found by **multiplying** the probability of the first event by the probability of the second event.

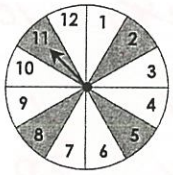
Examples

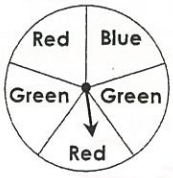
1. What is the probability of rolling a standard die twice and getting an even number, then 5?

$\frac{3}{6} \cdot \frac{1}{5} = \frac{3}{30} = \frac{1}{10}$

2. What is the probability of tossing a coin three times and getting tails each time?

$\frac{1}{2} \cdot \frac{1}{2} \cdot \frac{1}{2} = \frac{1}{8}$





3. If each spinner to the left is spun once, find each probability.

a) P(11, then red)

$\frac{1}{12} \cdot \frac{3}{5} = \frac{3}{60} = \frac{1}{20}$

b) P(unshaded, then green)

$\frac{8}{12} \cdot \frac{2}{5} = \frac{16}{60} = \frac{4}{15}$

c) P(at least 3, then blue)

$\frac{10}{12} \cdot \frac{0}{5} = 0$

d) P(even and shaded, then not red)

$\frac{2}{10} \cdot \frac{2}{5} = \frac{4}{50} = \frac{2}{25}$

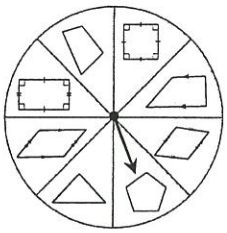
4. A card is randomly drawn from a standard deck, then a date in the month of June is chosen at random.

a) P(ace, then odd)

$\frac{4}{52} \cdot \frac{15}{30} = \frac{60}{1560} = \frac{6}{156} = \frac{2}{52} = \frac{1}{26}$

b) P(spade, then a multiple of 4)

$\frac{13}{52} \cdot \frac{7}{30} = \frac{91}{1560}$



5. The spinner to the left is spun once, then a standard die is rolled. Find each probability.

a) P(quadrilateral, then 6)

$\frac{1}{8} \cdot \frac{1}{6} = \frac{1}{48}$

b) P(triangle, then odd)

$\frac{1}{8} \cdot \frac{3}{6} = \frac{3}{48}$

c) P(square, then at most 2)

$\frac{1}{8} \cdot \frac{2}{6} = \frac{1}{24}$

d) P(parallelogram, then prime)

$\frac{3}{8} \cdot \frac{3}{6} = \frac{3}{16}$

6. There are 5 red marbles, 1 orange marble, 2 green marbles, and 4 purple marbles in a bag. A marble is drawn, replaced, then another marble is drawn. Find each probability.

a) P(orange, then purple)

$\frac{1}{12} \cdot \frac{4}{12} = \frac{1}{36}$

b) P(purple, then green)

$\frac{4}{12} \cdot \frac{2}{12} = \frac{1}{18}$

c) P(both orange)

$\frac{1}{12} \cdot \frac{1}{12} = \frac{1}{144}$

d) P(both red)

$\frac{5}{12} \cdot \frac{5}{12} = \frac{25}{144}$

Dependent Events

- In dependent events, the outcome of one event **affects** the outcome of the other event.
- The probability of two dependent events is found by **multiplying** the probability of the first event by the probability of the second event after the first event has already occurred.

Examples

7. There are 3 green markers, 6 yellow markers, 4 red marker, and 12 blue markers in a pencil box. A marker is drawn, not replaced, then another marker is drawn. Find each probability.

a) P(red, then blue)

$\frac{4}{25} \cdot \frac{12}{24} = \frac{2}{25}$

b) P(yellow, then green)

$\frac{6}{25} \cdot \frac{3}{24} = \frac{3}{100}$

c) P(both blue)

$\frac{12}{25} \cdot \frac{11}{24} = \frac{11}{50}$

d) P(both yellow)

$\frac{6}{25} \cdot \frac{5}{24} = \frac{1}{20}$

8. A bag contains 16 lottery balls, numbered 1-16. A ball is drawn, not replaced, then another is drawn. Find each probability.

a) P(even, then odd)

$\frac{8}{16} \cdot \frac{8}{15} = \frac{8}{30} = \frac{4}{15}$

b) P(10, then even)

$\frac{1}{16} \cdot \frac{7}{15} = \frac{7}{240}$

c) P(less than 13, then 16)

$\frac{12}{16} \cdot \frac{1}{15} = \frac{1}{20}$

d) P(both multiples of 5)

$\frac{3}{16} \cdot \frac{2}{15} = \frac{1}{40}$