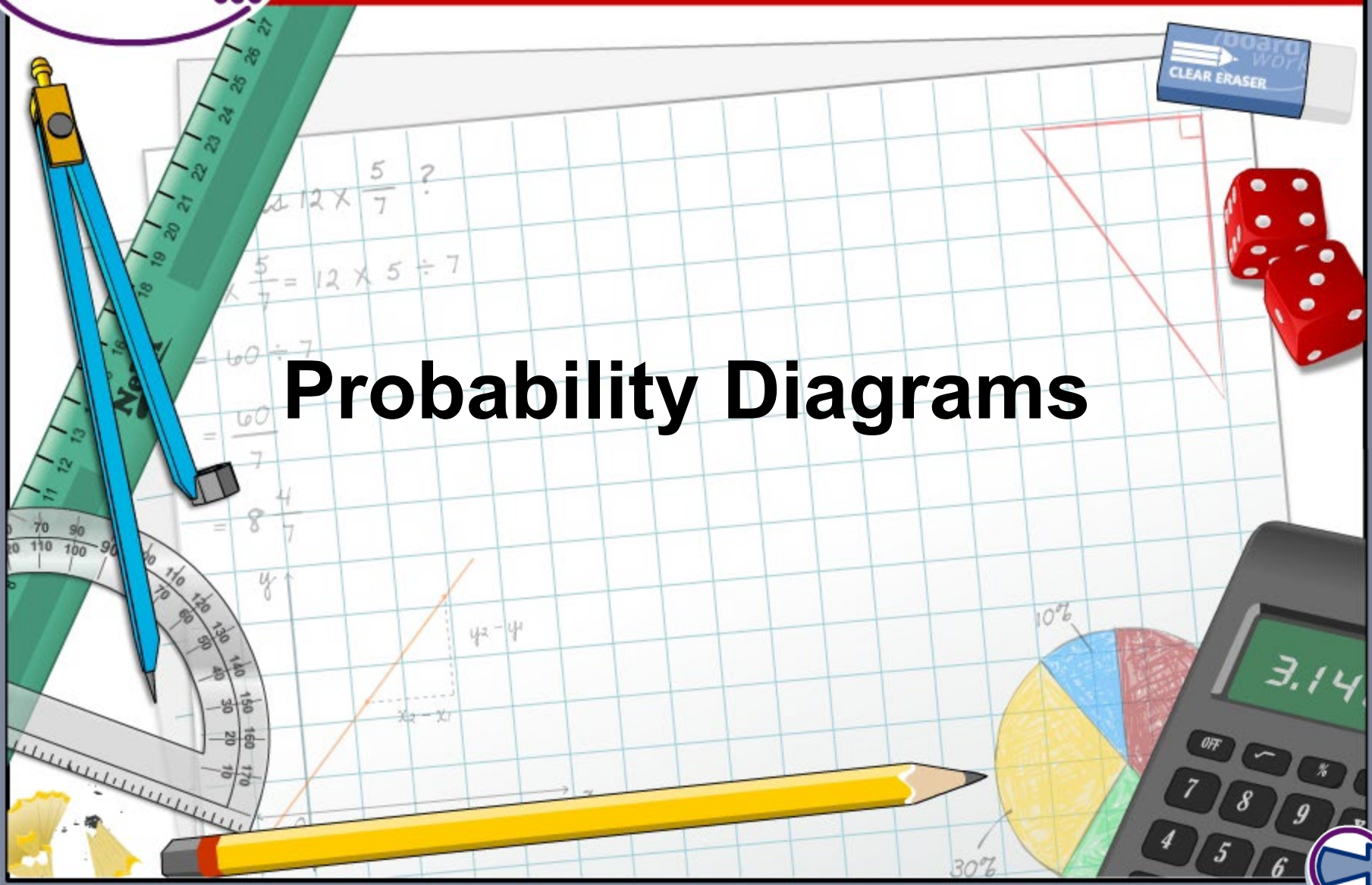


Probability Diagrams

Information

Common core icons

This icon indicates a slide where the Standards for Mathematical Practice are being developed. Details of these are given in the Notes field.

Slides containing examples of mathematical modeling are marked with this stamp.

This icon indicates an opportunity for discussion or group work.

The **Standards for Mathematical Practice** outlined in the Common Core State Standards for Mathematics describe varieties of expertise that mathematics educators at all levels should seek to develop in their students.

These are:

1) Make sense of problems and persevere in solving them.

2) Reason abstractly and quantitatively.

3) Construct viable arguments and critique the reasoning of others.

4) Model with mathematics.

5) Use appropriate tools strategically.

6) Attend to precision.

7) Look for and make use of structure.

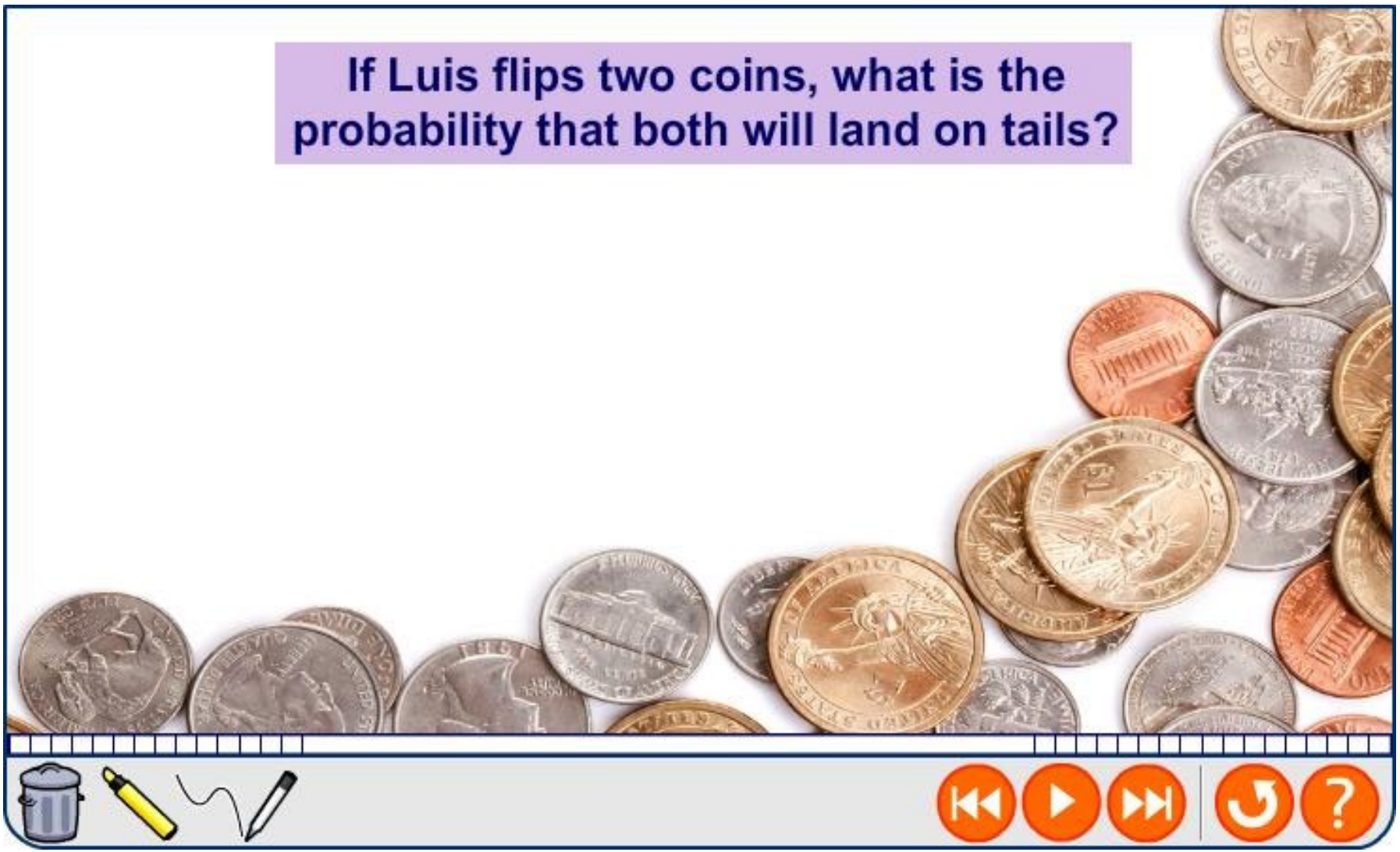
8) Look for and express regularity in repeated reasoning.

This icon indicates that the slide contains activities created in Flash. These activities are not editable.

This icon indicates teacher's notes in the Notes field.

Multiple outcomes

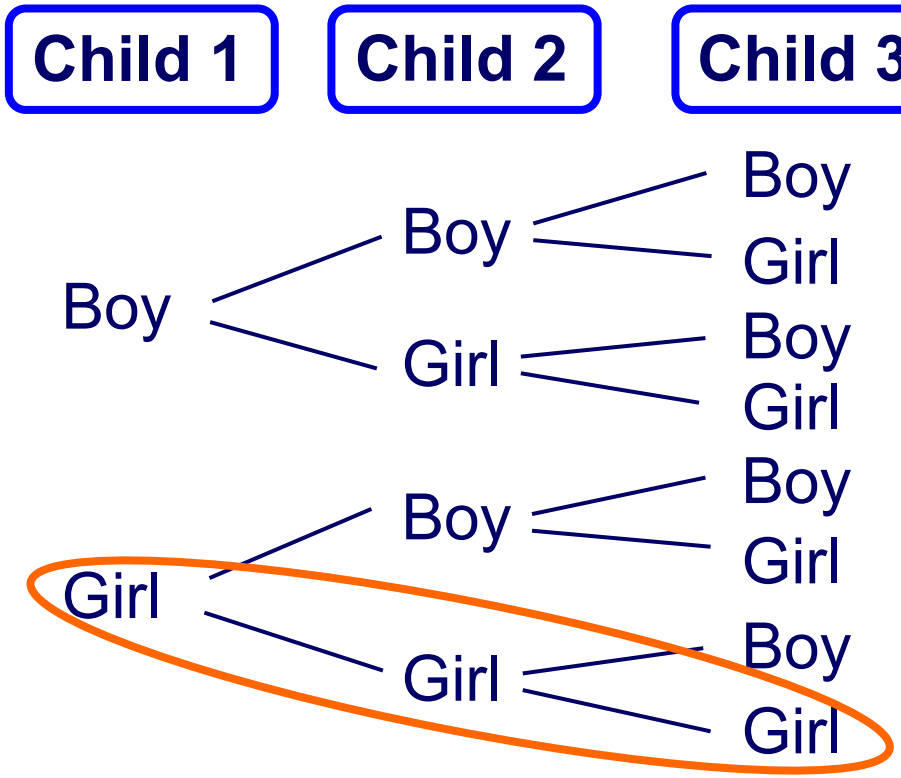
If Luis flips two coins, what is the probability that both will land on tails?



Multiple outcomes

Mr. and Mrs. Johnson are expecting triplets. How likely are they to have three girls?

We can draw a tree diagram to find all the possible outcomes:



There are 8 outcomes, and only 1 of these is three girls.

$$P(3 \text{ girls}) = \frac{1}{8}$$

Finding the sample space

Dominic is looking for his classroom on the first day of school. There are 3 hallways on the 7th grade floor, and each hallway has 5 classrooms.

How likely is it that the first classroom he enters will be the correct one?

Can you think of a faster method for finding the sample space than making a table or diagram and counting the outcomes?

Finding the sample space

MODELING

board works

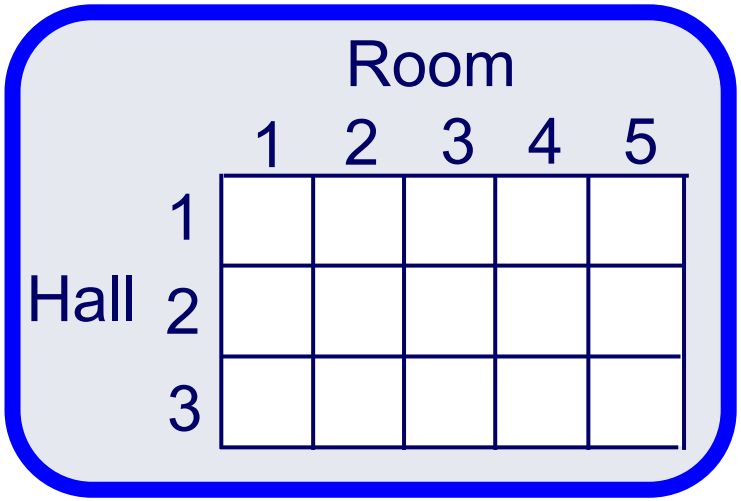
Dominic is looking for his classroom on the first day of school. There are 3 hallways on the 7th grade floor, and each hallway has 5 classrooms. How likely is it that the first classroom he enters will be the correct one?

We know that when we make the table, there will be a row for each hall and a column for each classroom.

We can use multiplication to find the total number of spaces in the table.

$3 \times 5 = 15$

There are **15** rooms he could choose, and only **1** would be the right one, so the chances are $\frac{1}{15}$.



Fundamental counting principle

This method is called the **fundamental counting principle**. It is a quick way to figure out the total number of possible outcomes for two or more experiments.

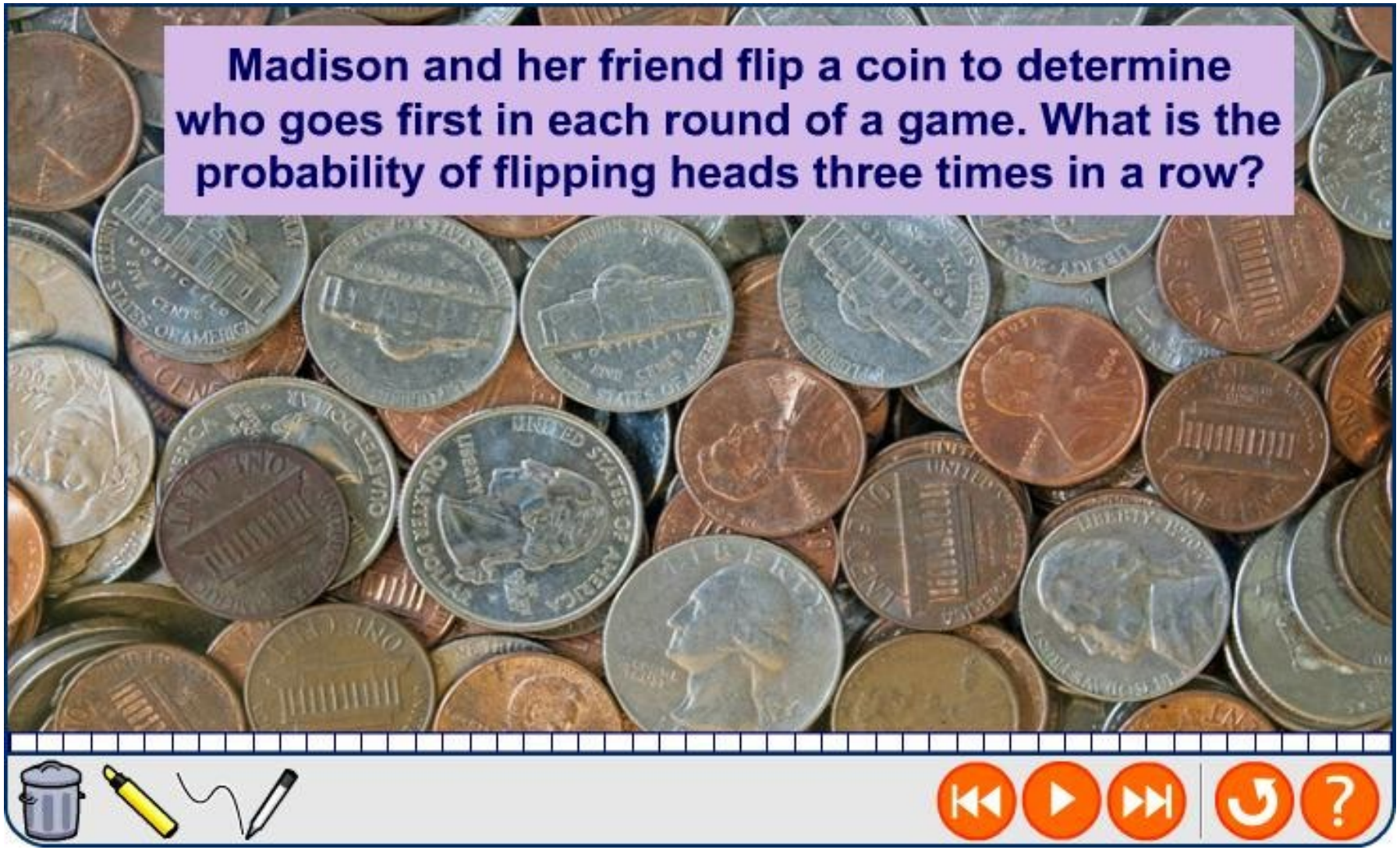
An ice cream shop has 10 flavors of ice cream and 5 different toppings. How many different combinations could we make of one flavor and one topping?

$10 \times 5 =$ **50 combinations**

The shop also offers a choice of cup, cone, or chocolate-dipped cone. How many different combinations of flavor, topping and container are there?

$10 \times 5 \times 3 =$ **150 combinations**

Probability of multiple events



Independent and dependent

Independent	Dependent

Which of these outcomes are dependent and which are independent?

Press **start** to begin

start

rolling double sixes

S C

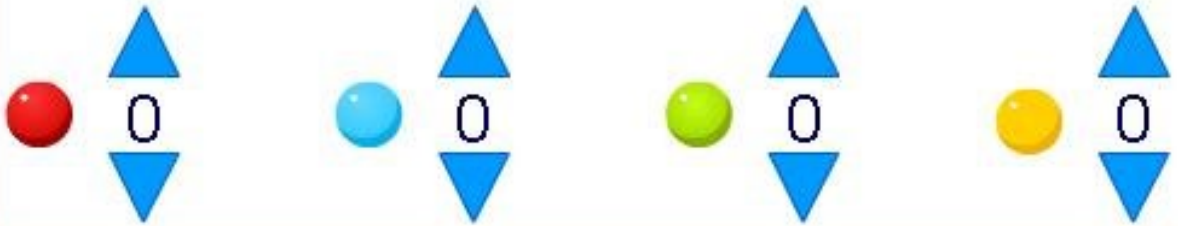
Gumball machine

Choose how many gumballs of each color to load into the machine. What is the probability of getting two red gumballs in a row?

Probability that the 1st gumball is red

Probability that the 2nd gumball is red

Combined probability



Probability basketball