

Jump Along: Factor Families on the Number Line

Description: Students investigate factors from a visual perspective as they find all the ways a rabbit can take equal-size jumps to reach a target number. Students write multiplication sentences to represent the rabbit's jumps, and uncover the commutative property of multiplication.

Technology Strength: The interactive model of multiplication engages students and provides immediate feedback in the form of the rabbit's actions and the traces on screen. The ease of using the model encourages students to experiment, make conjectures, and test their ideas.

Objectives: Find all the factors of a number; write multiplication number sentences; make and test conjectures; understand the commutative property of multiplication

Prerequisites: Experience writing number sentences

Suggested Grade Level: 3 to 4

Sketchpad Level: Beginning

Suggested Duration: 60 minutes

Suggested Classroom Setting: Whole Class, Student Pairs. This activity, designed for use by student pairs, can be easily modified for whole-class use.

Preparation: Review the Activity Notes. Preview the student sketch. Work through the steps on the worksheet and make a copy of the worksheet for each student.

Materials: None

Student Worksheet(s): Jump Along Factor Families

Student Sketch: Jump Along Factor Families.gsp

Presentation Sketch: None

Vocabulary: Number line, multiplication, number sentence, factor

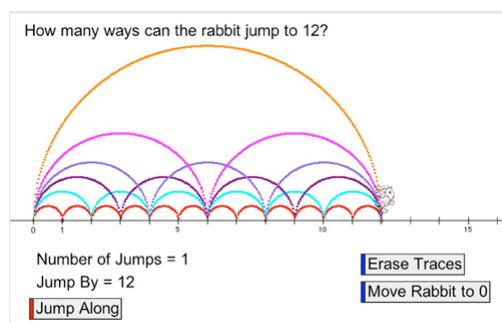
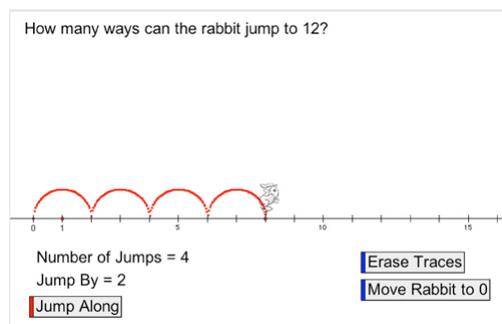
Acknowledgement: This activity is based on an activity and Sketchpad model created by Nathalie Sinclair.

Sketchpad Version: GSP5

Using the Sketch:

The model shows a number line with a rabbit sitting at 0. The rabbit's movement is controlled by the values of two parameters: *Number of Jumps* and *Jump By*. When the *Number of Jumps* parameter equals 4 and the *Jump By* parameter equals 2, for example, the rabbit takes 4 jumps of size 2 when *Jump Along* is pressed. The traces of the rabbit's jumps are left behind as a record of its movement.

Students experiment with different ways to reach a given target number. To land at 12, for example, students change the values of the two parameters so that the rabbit takes 1 jump of size 12, 2 jumps of size 6, 3 jumps of size 4, 4 jumps of size 3, 6 jumps of size 2, and 12 jumps of size 1. By making each set of jumps a different color, students form an attractive display. Students look for patterns in the rabbit's traces and uncover, among other findings, the commutative property of multiplication.



Sketch Tips:

Sketch Tips show skills needed in this activity, and the step at which the skill is first used.

Sketch Tip	Tip Sheet or Tip Video
Step 1: Open, print, and save a document	Working with Documents
Step 1: Change to a different page using page tabs	Moving Between Pages
Step 2: Select, deselect, and drag objects with the Arrow tool	Using the Arrow Tool
Step 2: Color an object using Display Color	Changing Color
Step 2: Change the value of a number (parameter)	Changing Parameters