For Loop Fun

Lesson time: 25 Minutes   Basic lesson time includes activity only. Introductory and Wrap-Up suggestions can be used to delve deeper when time allows.

LESSON OVERVIEW

We know that loops allow us to do things over and over again, but now we're going to learn how to use loops with extra structure built right in.

TEACHING SUMMARY

Getting Started - 15 minutes

    1) [Review](#)
    2) [Vocabulary](#)
    3) [For One and All](#)

Activity: For Loop Fun - 25 minutes

    4) [For Loop Fun](#)

Wrap-up - 10 minutes

    5) [Flash Chat](#) - What did we learn?
    6) [Vocab-Shmocab](#)

Assessment - 5 minutes

    7) [For Loop Fun Assessment](#)

LESSON OBJECTIVES

Students will:

- Determine starting value, stopping value, and interval of "for loop"
- Illustrate the counter values hit each time through a for loop during runtime

TEACHING GUIDE

MATERIALS, RESOURCES AND PREP

For the Student

- Dice (3 per pair of students)
- Pens & Pencils
- [For Loop Fun Worksheet](#)
- [For Loop Fun Assessment](#)

For the Teacher

- This Teacher Lesson Guide
- Print one [For Loop Fun Worksheet](#) per group
- Print one [For Loop Fun Assessment](#) for each student

GETTING STARTED (20 MIN)

1) Review

This is a great time to review the last lesson that you went through with your class. We suggest you alternate between asking questions of the whole class and having students talk about their answers in small groups.

Here are some questions that you can ask in review:

- What did we do last time?

- What do you wish we would have had a chance to do?

- Did you think of any questions after the lesson that you want to ask?

- What was your favorite part of the last lesson??

LESSON TIP *Finishing the review by asking about the students' favorite things helps to leave a positive impression of the previous exercise, increasing excitement for the activity that you are about to introduce.*

2) Vocabulary

This lesson has one new and important word:
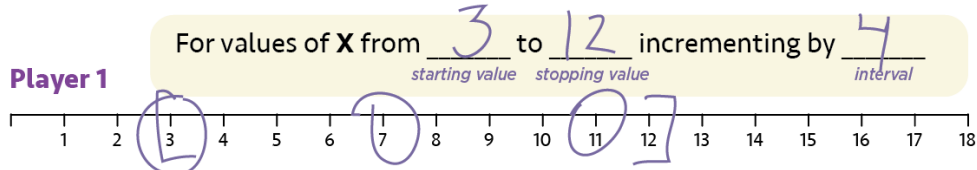

For Loop - Say it with me: For-Loop
Loops that have a predetermined beginning, end, and increment (step interval)
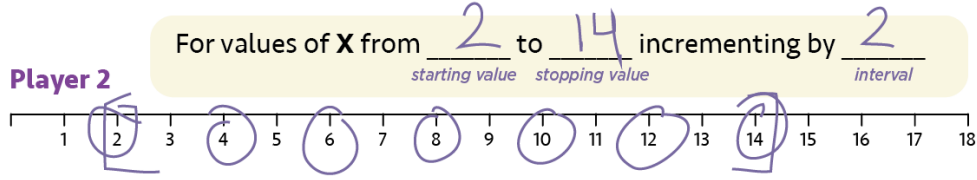
3) For One and All

- If you did the original loops lesson (remember The Iteration?) you can call back to the usefulness of loops in general
- Point out that there are certain loops that happen very frequently, for example, loops where you need to keep track of how many times you have been through
  - Sometimes, you don't want to start with one
  - Sometimes, you don't want to count by ones
  - For Loops give you a powerful way to keep a counter that starts when you want, ends when you want, and increases by whatever size step that you want
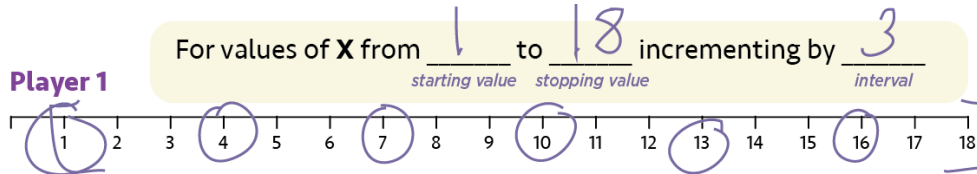
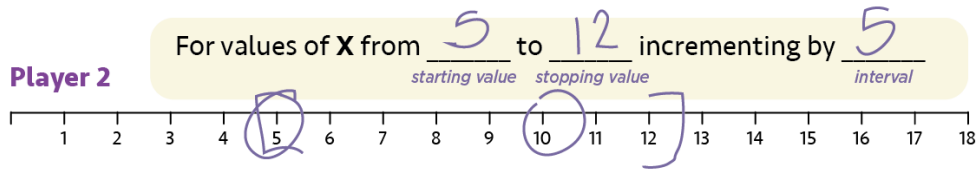Here, you can jump right into a sample of the game

SCORE

ROUND 1

Player 1

For values of **X** from ___3___ to __12__ incrementing by __4__
starting value *stopping value* *interval*

1 2 3 4 5 6 7 8 9 10 11 12 13 14 15 16 17 18

21

Player 2

For values of **X** from ___2___ to __14__ incrementing by __2__
starting value *stopping value* *interval*

1 2 3 4 5 6 7 8 9 10 11 12 13 14 15 16 17 18

56

ROUND 2

Player 1

For values of **X** from ___1___ to __18__ incrementing by __3__
starting value *stopping value* *interval*

1 2 3 4 5 6 7 8 9 10 11 12 13 14 15 16 17 18

51

Player 2

For values of **X** from ___5___ to __12__ incrementing by __5__
starting value *stopping value* *interval*

1 2 3 4 5 6 7 8 9 10 11 12 13 14 15 16 17 18

15

ROUND 3

Player 1

For values of **X** from ___2___ to __10__ incrementing by __4__
starting value *stopping value* *interval*

1 2 3 4 5 6 7 8 9 10 11 12 13 14 15 16 17 18

18

Player 2

For values of **X** from ___3___ to __16__ incrementing by __4__
starting value *stopping value* *interval*
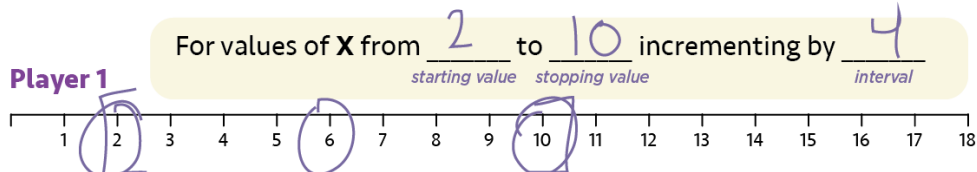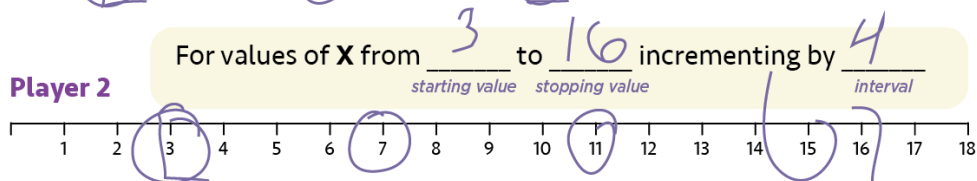
1 2 3 4 5 6 7 8 9 10 11 12 13 14 15 16 17 18

36

ACTIVITIES: (20 MIN)

4) [For Loop Fun](#)

Sometimes we want to repeat things a certain number of times, but we want to keep track of values as we do. This is where a "for loop" comes in handy. When you use a for loop, you know right from the start what your beginning value is, what your ending value is, and how much the value changes each time through the loop.
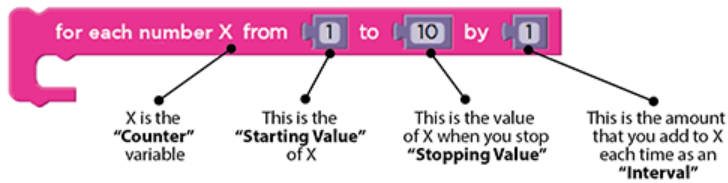
Directions:

1) Divide students into pairs

2) To start the round, each student rolls three times:
- One die to determine the starting value of X
- Three dice to determine the stopping value for X
- One die to determine the step interval of X each time through

3) Use one of the provided number lines to trace the for loop that they've made
- Start at the starting value of X
- Count down the number line, circling the numbers at the rolled interval
- Stop when you get to the predetermined stopping value

4) Add all of the circled values to your score, then let the other player take a turn

5) Best 2 out of 3 wins

LESSON TIP

When you play this game, it's as if you're running through a loop like this

for (x=startValue; x <= stopValue; x = x + interval){
circle currentXvalue;
add currentXvalue to roundScore;
}

It may be difficult for young students to understand this written in pseudocode, but it may be helpful to have you explain out loud (and perhaps with a diagram) what they will be using as the content of a for loop.

WRAP-UP (5 MIN)

5) Flash Chat: What did we learn?

- What would your interval need to be if you wanted to count from 4 to 13 by threes?
- What kinds of things do you think you could do with a for loop?
- Can you reproduce a normal loop using a for loop?
  - What would you need to do?

> **LESSON TIP**
>
> *Flash Chat questions are intended to spark big-picture thinking about how the lesson relates to the greater world and the students' greater future. Use your knowledge of your classroom to decide if you want to discuss these as a class, in groups, or with an elbow-partner.*

6) Vocab Shmocab

- Which one of these definitions did we learn a word for today?

  "Doing something more than once the exact same way"
  "Loops that have a predetermined beginning, end, and increment."
  "Statements that only run under certain conditions"

  ...and what is the word that we learned?

ASSESSMENT (5 MIN)

7) [For Loop Fun Assessment](#)

- Hand out the assessment worksheet and allow students to complete the activity independently after the instructions have been well explained.
- This should feel familiar, thanks to the previous activities.

EXTENDED LEARNING

Use these activities to enhance student learning. They can be used as outside of class activities or other enrichment.

Run it Backward

- Try this activity again, but this time have the start number be selected using three dice, and the stop number with only one. Make sure to have a *negative* increment!

Hop Scotch

- Using chalk, draw a hop scotch diagram outside on the blacktop
  - Number the squares from bottom to top
  - Have students give each other a start square, stop square, and how many at a time they need to jump
  - When the jumper is done, have them write down the loop they just performed
  - Start adding additional activities to be done at each square, this will add complexity to the written portion, as well