Use More Language

Objective Use *if* to talk about patterns, function tables, and ordered pairs.

45 minutes

Teach this lesson:

- **After** introducing lessons on functions and ordered pairs in the grade-level math textbook
- **Before** students complete the activities on page 119 of the student worktext

You need these materials:

- string, tape, and index cards
- a marble or other small object
- Transparency 60

EXTENSION AND ENRICHMENT — 10 minutes

Use string and tape to lay out axes of a coordinate graph in the center of the classroom. Label the points along the axes with index cards bearing the numbers 0, 1, 2, . . . Then have students set up rows and columns of chairs to represent the intersections of these points on the graph. Give a direction using an ordered pair, such as: *[Mala], please sit in the chair that is at (3, 5).* Then have students take turns giving one another directions of this sort. You can also have a student sit on a chair at random and have the rest of the students name the point he or she chose.

A Introduce

Write the word *if* on the board. Read it aloud. Say: *The word* if *can be used in different ways. In this module, you'll learn one way that* if *is used in math problems.*

- **Then hold up a marble or other small round object.** Say the sentence starter *If I drop this marble . . .*, and challenge students to complete the thought. Ask them to express their answers in a complete sentence that includes the sentence starter, as in *If I drop this marble, it will bounce/it will roll away/it will make a sound when it hits the floor.*
- **Repeat with other sentence starters, such as *If I turn off the lights . . .*, *If the fire alarm rings . . .*, or *If I forget my lunch . . .*.** Have students complete each sentence. Then have students try forming sentences of their own with *if,* either with a partner or together with the entire class.

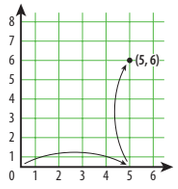
Then read aloud the Lesson Objective with students. Briefly review number patterns, function tables, and ordered pairs by going around the room and asking students to say something they know about one of these three topics.

Use More Language

LESSON 3

Objective Use *if* to talk and write about patterns, function tables, and ordered pairs.

Learn the Language

1 3 9 27 ? ?	<table><tr><th>input</th><th>output</th></tr><tr><td>1</td><td>9</td></tr><tr><td>2</td><td>10</td></tr><tr><td>3</td><td>11</td></tr><tr><td>4</td><td>12</td></tr><tr><td>5</td><td>?</td></tr><tr><td>6</td><td>?</td></tr></table>	
If I multiply each number by 3, I get the next number in the pattern. If I multiply 27 by 3, I get 81. If I multiply 81 by 3, I get 243.	If I add 8 to each input number, I get the output number. If I add 8 to 5, I get 13. If I add 8 to 6, I get 14.	If I start at 0 and move 5 units to the right and 6 units up, I get to the ordered pair (5, 6).

Practice the Language

Directions Write either the first part or the second part of the *if* sentences. Answer number 7 in a complete sentence on a separate sheet of paper.

1. If I start at 0 and move 4 units to the right and 1 unit up, I get to the ordered pair (4, 1).

2. If I start at 0 and move 7 units to the right and 9 units up, I get to the ordered pair (7, 9).

Use the number pattern below for questions 3 and 4:
5, 10, 15, 20, ?

3. If I add 5 to each number, I get the next number.

4. If I add 5 to 20, I get 25.

Use the table below for numbers 5 and 6:

input	4	5	6	7
output	12	15	18	?

5. If I multiply the input number by 3, I get the output number.

6. If I multiply 7 by 3, I get 21.

7. Write a sentence with *if* about the number pattern 64, 32, 16, 8, 4, 2, ?. Possible answer: If I divide each number by 2, I get the next number.

Highlighted words and phrases may affect student comprehension.

B Teach and Learn

Draw students' attention to the number pattern on the upper left of page 119. Read aloud the numbers.

BP 3 **Ask questions about the sequence, such as:** *Are the numbers increasing or decreasing?* (increasing) *Are the numbers odd or even?* (odd) Then ask students to study the pattern of the numbers with a partner and share their thinking with the class. Elicit that the pattern, or rule, is *multiply each number in the pattern by three.*

Read aloud the first *if* sentence below the number sequence. Say: *Let's suppose I multiply each number by 3. What will happen then?* Establish that you will get the next number in the sequence, or pattern. Explain that *let's suppose that . . .* is another way of saying *if . . .* (It is often useful for students to have more than one way of understanding and expressing a concept.) Then read aloud the *if* sentence again.

Write the following on the board:
If I multiply 3 by 3, I get 9.
If I ____, I get ____.

Ask students how many parts the sentence has and what separates the parts. Elicit that the sentence has two parts and that a comma separates them.

- **Say:** *Sentences with* if *have two parts. In the first part, you tell what you plan to do. In this sentence, I plan to multiply each number by 3.* Have students underline this part of the sentence in their student worktexts.
- **Then explain that the second part of an *if* sentence tells what will happen when you carry out your plan.** Ask students what will happen if you multiply each number by three. Elicit again that you will get the next number in the sequence. Have students underline this part of the sentence in their student worktexts.

Say: *I wonder what the number after 27 will be. Let's see. If I multiply 27 by 3, ____.* Pause and let students conclude your sentence with the phrase *I get 81.* Emphasize the comma where the two parts of the sentence meet. Then have students use the sentence frame with the number that follows 81 (243).

BP 3 **Have students work with partners using the sentence frame.** Have one student say the first part (such as: *If I multiply 9 by 3).* Have the other student complete the sentence. Then have the students switch roles. Allow students to use the sentence frame the first few times, but encourage them to rely instead on their memories and English language skills to form the sentences after several repetitions.

Move on to the information about function tables. Remind students that function tables are a lot like number patterns. Have students explain to a partner how they are alike and different. Then help students explore *if* sentences about function tables by adapting what you did for the number pattern given in the student worktext, as follows:

- **Ask students to determine what they think the relationship is between the input and output numbers.** Encourage them to state the relationship in words *(the output is 8 more than the input)* and as an equation, using *x* for input and *y* for output ($y = x + 8$).
- **Read aloud the first *if* sentence, helping students divide it into parts:** what you plan to do, which is described before the comma *(add 8 to each input number)* and what will happen, which appears after the comma *(get the output number).* Repeat with the other two sentences.
- **Ask volunteers to use the sentence frame on the board to describe the other relationships in the function table.**
- BP 3 **Wrap up this part of the lesson.** Have students practice saying the various parts of the three *if* sentences with a partner, as they did in the previous section on number patterns.

Call students' attention to the third column on page 119. Go through this information with students as you did above, noting that the first part of the sentence here is considerably longer than it was in the two earlier examples, and that when you get to the ordered pair, you arrive at a point so you use *get to* instead of just *get.* Demonstrate how the sample graph shows the movements described in the planning part of the *if* sentence. Conclude as before by having students say parts of the sentence to a partner.

C Review and Practice

Display Transparency 60. Help students formulate three *if* sentences for the first example, one a general statement (*If I subtract 4 from each number, I get the next number in the pattern*) and the other two specific statements (*If I subtract 4 from 18, I get 14. If I subtract 4 from 14, I get 10*).

BP 3 **Have students work with partners to make *if* sentences for the other two examples on the transparency.** Move around the room, checking students' work.

Read aloud the directions for Practice the Language. Have students complete the exercises independently.

D Assess and Intervene

Can students complete sentences with *if* clauses, based on Practice the Language on page 119? Use the rubric to identify students who need extra support through additional help and the Intervention activity.

Intermediate

- ☐ Includes the correct math content in at least 5 answers.
- ☐ Uses the sentence frame to complete numbers 1–7.

Example of a sentence a student might write: *If divide number by 2, get number next.*

Advanced

- ☐ Includes the correct math content in at least 6 answers.
- ☐ Completes numbers 1–7 in own words.

Example of a sentence a student might write: *If I divide all number by 2, I get next number.*

INTERVENTION 5 minutes

Use pantomime to help students explore the structure of an *if* sentence. Say the sentence: *If I run fast, I get tired.* Then say *If* and have students pantomime running fast. Follow by having them act tired. Repeat, saying the sentence with students as they act it out. Then repeat without the actions, only the words. Do it again with similar sentences that are easy to pantomime.