5.5 If–Then Statements and Their Converses

MATERIALS • index cards

TEKS a.6; 8.16.A, 8.16B

QUESTION **Is the converse of a conditional statement true?**

In Lesson 2.1, you learned that an if-then statement is a form of a conditional statement where the *if* part contains the hypothesis and the *then* part contains the conclusion. The *converse* of an if-then statement interchanges the hypothesis and conclusion of the original statement.

EXPLORE **Write the converse**

STEP 1 *Make cards*

Write each phrase below on a separate index card.

it swims	it is a tree	it flies	it needs water	it has wings
it is a duck	it grows	it is a bird	it is an airplane	it is a frog

STEP 2 *Write the conditional statement*

Place the cards face down. Select a card at random to be the hypothesis. Select another card at random to be the conclusion. Write the statement and determine whether it is true or false. If it is false, give a counterexample.

Hypothesis: it is a duck   Conclusion: it has wings

Statement: If it is a duck, then it has wings.

The statement is true. All ducks have wings.

STEP 3 *Write the converse*

Switch the order of the cards to create the converse statement. Determine whether the converse is true or false. If it is false, give a counterexample.

Hypothesis: it has wings   Conclusion: it is a duck

Statement: If it has wings, then it is a duck.

The statement is false. Airplanes have wings, but they are not ducks.

STEP 4 *Repeat*

Repeat Steps 2 and 3 ten times. Keep a record of your conditional statements and their converses.

DRAW CONCLUSIONS **Use your observations to complete these exercises**

1. **REASONING** If a conditional statement is true, can you be sure that its converse is true? *Justify* your answer.

2. **REASONING** If the converse of a statement is true, can you be sure that the original statement is true? *Justify* your answer.