**Lesson Five:**

**Connection Questions**

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| Part | Content |
| Part 1 | Introduction to Connection Questions |
| Part 2 | Practice: Connection Questions |

# **Overview**

The purpose of this discourse lesson is to introduce connection questions as a type of authentic question. Connection questions create opportunities for promoting high-level thinking and reasoning during task-based mathematics discussions by allowing students to generate connections with things they have experienced or thought about as well as things they’ve experienced or shared with their classmates. The teacher will introduce students to connection questions by building on what students already know about authentic questions. Students will practice creating connection questions in a small-group activity.

# **Objectives**

At the end of this lesson, students will be able to:

* identify connection questions, and
* create connection questions.

# **Materials**

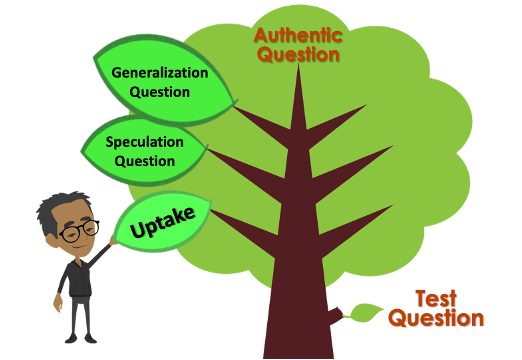
Question tree

Sticky notes

Previous math problems/math journals

### **Part 1: Introduction to Connection Questions**

### **[Slides 3-4: Question Tree]**

* ****Remind students about the types of authentic questions that were introduced in previous lessons: uptake, speculation, generalization, and analysis questions.
* Let students know that they are going to learn about another type of authentic question called a connection question.
* A connection question is one type of authentic question that is near the top of the tree where there are many branches and leaves, because this type of authentic question stimulates rich discussions about the text and promotes high-level comprehension.

### **[Slides 5-6: Connection Questions]**

Explain that connection questions are questions that make connections

* between the math problem and things students have experienced or thought about, and
* between the math problem and things that others in the group have experienced or shared with their peers.

Connection questions can sound like:

* *“Where have* ***you*** *seen …?*
* *“Have* ***you*** *and/or* ***your class*** *had a similar experience …?”*
* *“Does … remind* ***you*** *of other math problems you’ve done?”*

### **[Slide 7: Example 1]**

Remind students that we ask questions about math problems that will help us solve the problem.

Read the math problem is the purple box: There are 8 students in line for ice cream, and one-half of the students want vanilla. How many want vanilla ice cream?

Then read the example conversation.

|  |  |
| --- | --- |
| Naomi | Where else have you seen fractions represented, like one-half or one-third? |
| Carlos | When I cook with my abuela, a lot of the recipes have fractions, like half a teaspoon or 1/4 of a cup. |
| Catherine | My dad and I went to watch a football game and it was divided up into quarters. |

In this example, Naomi, Carlos, and Catherine are discussing the math problem on the right. Naomi starts off asking a connection question about the math problem, **“Where else have you seen fraction represented, like one-half or one-third?”** This connection questions asks students to make connections between a concept in the math problem and things students have done outside of math class.

Carlos and Catherine answer the connection question by providing different things they have experienced that involve fractions, such as measurements in cooking and watching a football game. Ask students if they can think of any other experiences they’ve had that involved fractions.

### **[Slide 8: Example 2]**

Read the math problem is the purple box: Consider different rectangles that have a perimeter of 36 feet. What is the largest area that such a rectangle could have?

Then read the example conversation.

|  |  |
| --- | --- |
| Carlos | Does this math problem remind you of anything you’ve done before? |
| A cartoon of a child  Description automatically generatedNaomi | Last month we went on a field trip to a museum and they had an exhibit where we could build race tracks. They gave us a certain length of track and we had to build a looping track with it. It’s kind of the same as having a certain perimeter in this problem. |

In this example, Carlos and Naomi are discussing the math problem on the right. Carlos starts off asking a connection question about the math problem, **“**D**oes this math problem remind you of anything you’ve done before?”** This connection questions asks students to make connections between a concept in the math problem and things they’ve done before.

Naomi answers the connection question by describing a field trip that the entire class went on the previous month. She explains a hands-on exhibit at the museum that reminded her of the math problem. Ask students if they can think of any other experiences they’ve had that remind them of this math problem.

### **[Slides 9-11]**

**Practice: Authentic Questions and Test Questions**

### **[Instruction]**

# In this practice, a cooperative-grouping situation (3-5 students) is recommended where students can take a shared role in generating connection questions about the math problem and practicing responding to them.

### **[Before]**

Have the students read “Jeffrey’s multiplication problem” again. Let students know that they will be focusing on asking and responding to connection questions based on this math problem.

### **[During]**

Each small group should come up with at least two connection questions about the math problem and write their questions on sticky notes (one question on each sticky note). Students can refer to previous math problems/their math journals to help them make connections. Students can then practice responding to them to figure out whether they are good connection questions.

### **[After]**

* Have one student from each group place their sticky notes on the Question Tree slide that is projected onto the board *or* the Question Tree poster. Students should place the notes in the appropriate location (i.e., by the speculation question leaf).
* Have students give feedback to the other groups’ questions. If repeated questions come up, cluster them into groups so that they can be addressed at the same time.
* If time permits, select one question and allow students to discuss in small groups.
* For future activities, collect all questions that were generated by students.