

ASSESSMENT RESOURCES

Using Addition and  
Subtraction to Solve  
Problems to 20



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# Pre-Test/Post-Test Administration

## test administration

The pre-test and post-test for this module have two versions — an on-grade level version and an intervention version. The on-grade level is designed for first graders. You can read the problems to the students as a class and have them answer individually. The intervention version is designed to be administered online or paper-and-pencil.

For the pre-test, let students know that this test will help you determine what they already know. Explain that the module will help them learn how to solve problems that seem difficult now.

For the post-test, remind students that this test will help you determine what they have learned about using addition and subtraction to solve problems to 20.

### Online Testing for the Intervention Version

Once your testing window has started, you can begin testing.

- Seat students individually in front of a computer.
- Give each student a piece of scratch paper.
- Make sure that students have pencils.
- Have students use their access codes to log in to the pre-test.
- Before each student begins the test, confirm that he or she is taking the correct test.


Tell students that:

- Each question will be displayed on the computer screen. Students should select the answer they think is best by clicking on the option choice and then clicking to confirm the choice.
- After students answer a question, the next question will appear on the computer screen.
- Students may choose to skip a question and flag it to come back to before ending the test.

During the test:

- Observe students as they work to make sure that they are actively engaged in the testing process.
- Support any students who seem to find the material challenging. Encourage them to make a good estimate for any problem they find difficult. You may wish to provide manipulatives.

Once students have answered all the questions, they should follow the online prompts to conclude the test.

 After the pre-test, if some students finish early, pair each of them with another student. Give each student a Student Book. Tell the students to read the instructions on page 1 of the Student Book and start working.



## Paper-and-Pencil Test

### On-grade Level Version:

- Seat students individually.
- Distribute tests.
- Make sure that students have #2 pencils.
- Read each question to students. Remind them that this is solo work.
- Give them time to answer the questions before you move to the next question.
- Collect their tests.

### Intervention Version:

- Print copies of the test and answer sheets for each student from ARO.
- Seat students individually.
- Distribute tests, answer sheets, and scratch paper.
- Make sure that students have #2 pencils.
- Instruct students to fill in the answers on their answer sheets.

During the test:

- Observe students as they work to make sure that they are actively engaged in the testing process.
- Support any students who seem to find the material challenging. Encourage them to make a good estimate for any problem they find difficult. You may wish to provide manipulatives.

After students finish, collect their tests, answer sheets, and scratch paper. You will need to upload students' answers to the ARO system so you can analyze the results.



After the pre-test, if some students finish early, pair each of them with another student. Give each student a Student Book. Tell the students to read the instructions on page 1 of the Student Book and start working.



## analyzing results

Irrespective of the method (online or paper-and-pencil) that you chose to administer the test, your students must be enrolled in the ARO system in order for you to obtain computer-generated reports.

These reports:

- Offer rich, instructionally-relevant information to teachers and administrators at the individual student, class, grade, school, and district levels.
- Include total test score performance information and item-level analysis for each student and for all students combined.
- Are important references in helping you to assess the misconceptions your students are struggling with and decide what concepts to focus on during the module.

For results:

- **Online Testing:** ARO will automatically generate performance reports.
- **Paper-and-Pencil Test:** Upload students' data to ARO. Once you have uploaded the data, ARO will generate performance reports.

Additional information about the online test reporting can be found on ARO.

Remember to give a copy of the reports to the students' regular mathematics teachers to help them in planning subsequent instruction.



### reflection



When students have finished working on their pre- or post-tests, ask them to open the Student Book to page 1 for the pre-test and page 75 for the post-test and write a response to the reflection prompt.



#### english language learners

It is important to point out to ELLs the progress they have made over the course of the module. Help them look back to where they were when they started so they can see how much they have progressed with both the language and the mathematics.

# Checkpoint 1

# 6



## preparation

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- Make a copy of the Checkpoint 1 for each student.
- Seat students individually and distribute the checkpoint lesson to each student.



## setting the direction

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Today's lesson is a checkpoint.

- Today we are going to do a checkpoint. First, I am going to read you some problems and let you write the answers. You will work solo for all of these problems.
- After we finish the checkpoint problems, we are going to do something that we call "Learning from the Checkpoint." You get to be the teacher! I will show you some mistakes that other students made when they wrote their answers, and you will try to explain what they were thinking that was not correct.

At the end of the lesson, collect the completed checkpoints. Enter the data from each checkpoint into ARO. Basic facts questions should be entered either as correct or incorrect. The report generated by ARO will help you assess whether students are on track and making sufficient progress.

## checkpoint

Read problem 1 to students. Remind them that this is solo work.

Have students work independently to complete the 30 quick questions in the checkpoint lesson.

## Checkpoint 1 6

**checkpoint**

Solve the problems below. Write your answers in the checkpoint lesson.

Do these problems as quickly as you can.

Time started:  Time finished:

$7 - 3 = $ <input type="text" value="4"/>	$10 - 5 = $ <input type="text" value="5"/>	<input type="text" value="5"/> $+ 4 = 9$
$5 + 5 = $ <input type="text" value="10"/>	$4 - 3 = $ <input type="text" value="1"/>	<input type="text" value="2"/> $+ 8 = 10$
$4 + 2 = $ <input type="text" value="6"/>	$8 - 5 = $ <input type="text" value="3"/>	<input type="text" value="0"/> $+ 4 = 4$
$8 + 1 = $ <input type="text" value="9"/>	$8 - 4 = $ <input type="text" value="4"/>	<input type="text" value="7"/> $+ 2 = 9$
$3 + 3 = $ <input type="text" value="6"/>	$8 - 0 = $ <input type="text" value="8"/>	<input type="text" value="6"/> $+ 1 = 7$
$4 + 6 = $ <input type="text" value="10"/>	$5 - 4 = $ <input type="text" value="1"/>	<input type="text" value="6"/> $+ 4 = 10$
$2 + 5 = $ <input type="text" value="7"/>	$8 - 6 = $ <input type="text" value="2"/>	<input type="text" value="1"/> $+ 9 = 10$
$6 + 3 = $ <input type="text" value="9"/>	$5 - 3 = $ <input type="text" value="2"/>	<input type="text" value="3"/> $+ 5 = 8$
$3 + 7 = $ <input type="text" value="10"/>	$10 - 3 = $ <input type="text" value="7"/>	<input type="text" value="2"/> $+ 3 = 5$
$4 + 5 = $ <input type="text" value="9"/>	$9 - 6 = $ <input type="text" value="3"/>	<input type="text" value="4"/> $+ 3 = 7$

Assessment Resources, page 12

## learning from the checkpoint

Students check their own answers quickly like they do in show me exercises. Do not take time to ask probing questions.

### Find the Difference Game

Model playing the game with one of the students to show the other students. Use two sets of the numbers from 0–10 (found in Study Cards).

1. Check your answers with the class.  
If you need to, correct your answers.

Assessment Resources, page 13

2. Play the Find the Difference game.

Use the Number cards (0–10) from your Study Cards to play with your partner.

Assessment Resources, page 13





### scaffolding for success

Try to pair students with similar levels of competence for this activity.

Shuffle and deal the cards equally between the two players.

Each player flips one card over, then finds the difference between the two numbers shown on the cards. The first person to call out the correct difference between the two cards keeps both cards. The player with the most cards at the end of the game wins.

Encourage the students to discuss the numbers and the difference.

Model different representations and ways of stating the problem. For example,

- $7 - 4 = 3$
- 7 take away 4 is equal to 3
- The difference between 7 and 4 is 3



### teaching strategies

This game may be used to practice addition facts to 20, by adding the card pairs.



### english language learners

Write the different ways of stating the problems on the board and have the group read them aloud with you. This will help ELLs with verbally expressing and comprehending the mathematics.



### scaffolding for success

Help students to build their mathematical vocabulary by continually modeling the use of new terms in the context of activities and discussions.

Suggest to students that they recheck facts on their “Things to Learn” ring after playing the game. Facts that have been mastered can be removed from the ring.



### reflection



When you have about 2 minutes left, stop the discussion, even if they are not finished. Have students respond to the reflection prompt in the Student Book.

# Checkpoint 2

# 12



## preparation

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- Make a copy of the Checkpoint 2 for each student.
- Seat students individually and distribute the checkpoint lesson to each student.



## setting the direction


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This lesson is a checkpoint lesson. Tell students to complete the problems. Ask them to do their work in the check point lesson and write the correct answers.

At the end of the lesson, collect the completed checkpoints. Enter the data from each checkpoint into ARO. The report generated by ARO will help you assess whether students are on track and making sufficient progress.

## checkpoint


 Read the problems one at a time to students while they follow along in the checkpoint lesson. After each problem, give students time to write their answers independently.


 The checkpoint portion of this lesson is all solo work.



As students are working on the checkpoint, walk around the room and select students whose work you would like to have presented. Look for work that has correct answers and work that has common misconceptions.

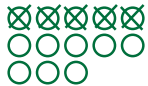
## Checkpoint 2 12


**checkpoint**

- Write an equation for this problem.  
How many fish?  


Possible answers:  
 $14 + 3 = ?$   
 $14 + 3 = 17$     There are 17 fish.
- Use a drawing to solve this problem.  
There were 8 birds in a tree. Some birds flew away.  
There were 4 birds left. How many birds flew away?  


$8 - ? = 4$       
Four birds flew away.
- Josh had 13 coins. He put 5 of the coins in his bank.  
How many coins were left?  
Show or tell how you know.  Show all parts of a complete solution.  

Possible answers:  
 $13 - 5 = \underline{\quad}$       
 $13 - 5 = 8$   
Josh had 8 coins left.



Assessment Resources, pages 14–15

## learning from the checkpoint



Remind students that now the group will discuss their solutions to each checkpoint problem. Explain that at the end of the discussion of each problem, students will have time to correct their answers in their checkpoint lessons if they need to.

### learning from the checkpoint

Talk about problems 1–3 with your class.  
If you need to, correct your answers.

Assessment Resources, page 15

Use the procedure described below to facilitate discussion of each checkpoint problem.

### Learning from Problem 1

The correct answer is 17 fish.



Some students may subtract rather than add, arriving at an answer of 11 fish.

Read the checkpoint problem again to the group as they follow along in the checkpoint lesson.

Call on the student you want to present.



### teaching strategies

You may decide to have students explain the solution for an incorrect answer or answers first. Identifying errors or misconceptions in solutions is engaging detective work and also sets the expectation that the correctness of answers is determined by mathematical justification.

### Discussing the Correct Answer

<Name>, explain to us how you got your answer.

Invite the student presenting to show her work in the checkpoint lesson and point to parts of her solution as she explains her reasoning.

Ask questions similar to these:

- Does this explanation make sense?
- Did anyone get this answer a different way? Explain your way to us.
- How are <Name's> way and <Name's> way alike? How are they different?
- Does anyone disagree? Tell us why you disagree.



### scaffolding for success

During the discussion, you may record on the board or chart paper to help the group follow the explanations students give. Students can then refer to both the students' explanations and your recording during the discussion.

### Discussing an Incorrect Answer

Discussion should elicit student thinking about why this is an addition problem and what misconception might lead a student to think of it as a subtraction problem. One likely explanation is that a student sees one larger group and one smaller group and thinks he should find the difference.

Students should point out that the question “How many fish?” asks about all of the fish.

● <Name>, explain to us how you got your answer.

Invite the student presenting to show her work in the checkpoint lesson and point to parts of her solution as she explains her reasoning.

Ask questions similar to these:

- Does this explanation make sense?
- What mistake do you see?
- How can you help us understand the mistake?
- How would you change this math drawing?
- Is there another type of math drawing or diagram you think would be better?
- How do you know that you should [add] to get the answer?
- What might lead a student to think he should [subtract]?



### teaching strategies

This discussion is an opportunity to engage students in the mathematical practice of explaining their own reasoning and making sense of other’s reasoning (MP3). As you facilitate the discussion, note students’ ability to explain their conclusions to others and justify the errors in and correctness of solutions shared.

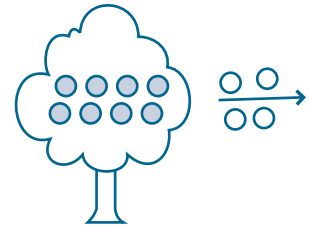
Give students a minute to correct their answers in their checkpoint lessons if they need to.

## Learning from Problem 2

The correct answer is 4 birds flew away.



Some students may make a math drawing and then interpret their drawing incorrectly. For example, a student might make the drawing at right and then add the 8 circles in the tree and the 4 outside the tree, forgetting what the symbols (circles) represent in the story context.



Have student present both incorrect and correct answers. Use the questions list on page 9 during the presentation.

Discussion should elicit the idea that problem solvers need to go back and forth between their math drawings (or equations) and what the parts of the drawing (or equation) mean in the context. Forgetting to think about the story can result in an answer that does not make sense. Students might explain that some birds flew away, so the answer cannot be more than the 8 birds that were in the tree to start.

Students might also suggest that another representation, such as a tape diagram, would be good to use in this problem and would not lead students to make a mistake as easily.

## Learning from Problem 3

The correct answer is that Josh had 8 coins left.

Have student present both incorrect and correct answers. Use the questions list on page 9 during the presentation.



Some students may get the answer 12. Students may recognize a common error: subtracting the smaller digit from the larger digit (taking 3 from 5) without making sense of that calculation.

Students might suggest asking whether an answer of 12 makes sense: If you start with 13 and take 5 out, you can't have 12 left. That would be taking only one out.



## reflection



When you have about 2 minutes left, stop the discussion, even if they are not finished. Have students respond to the reflection prompt in the Student Book.

# Checkpoint 1

# 6

## checkpoint

Solve the problems below. Write your answers in the checkpoint lesson.

Do these problems as quickly as you can.

Time started:

Time finished:

$7 - 3 =$

$10 - 5 =$

$\square + 4 = 9$

$5 + 5 =$

$4 - 3 =$

$\square + 8 = 10$

$4 + 2 =$

$8 - 5 =$

$\square + 4 = 4$

$8 + 1 =$

$8 - 4 =$

$\square + 2 = 9$

$3 + 3 =$

$8 - 0 =$

$\square + 1 = 7$

$4 + 6 =$

$5 - 4 =$

$\square + 4 = 10$

$2 + 5 =$

$8 - 6 =$

$\square + 9 = 10$

$6 + 3 =$

$5 - 3 =$

$\square + 5 = 8$

$3 + 7 =$

$10 - 3 =$

$\square + 3 = 5$

$4 + 5 =$

$9 - 6 =$

$\square + 3 = 7$

**learning from the checkpoint**

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1. Check your answers with the class.  
If you need to, correct your answers.

2. Play the **Find the Difference** game.

Use the Number cards (0–10) from your Study Cards to play with your partner.



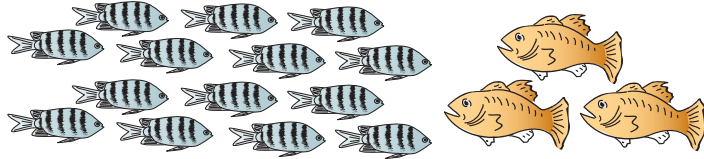
## Checkpoint 2

# 12

### checkpoint

1. Write an equation for this problem.

How many fish?




2. Use a drawing to solve this problem.

There were 8 birds in a tree. Some birds flew away.  
There were 4 birds left. How many birds flew away?



- 3.** Josh had 13 coins. He put 5 of the coins in his bank.  
How many coins were left?  
Show or tell how you know.

 Show all parts of a complete solution.



 **learning from the checkpoint**

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Talk about problems 1–3 with your class.  
If you need to, correct your answers.

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