**ATME5b**

**Solve-Instruction Condition**

List to Bring to Session

Scripts

TIMERS

Schedule

Student Response Packet (Problem Solving Block, Midtest)

Midtest and Conceptual Instruction Prompts

Problem Solving Worksheet

Blank paper to use for session notes if needed and to give to student for scratch work

File folder for putting collected data in

**Underlined text is unique to this condition**

It is important that you are not reading the script – memorize what you can – and make lots of eye contact**WELCOME**

**Today we’re going to try to solve some math problems and talk about some math ideas.**

**Please write your first name.**

**Solve Block**

**First, you’re going to work on some math problems on your own. If you’d like help adding on the problems, you may use anything that helps like your fingers, a number line or a hundreds chart.**

**I want you to explore and think about some new math problems on your own. It’s okay if you’re not sure about the right answer. It will still help to just look at the problems very carefully and think about them – it will help you learn more about them later.**

**For each problem, you need to figure out the number that goes in the box to make the number sentence true.**

**And, are you ready for a hint?** (pause and wait for some response) **When working on these problems**, **it’s really helpful to think about what the equal sign means and if there might be a better way to think about what it means. OK? The equal sign is important.** **Are you ready for another hint? The problems on a page go together. So you can use the answer to one problem to help you with the next one. So think about how the problems on a page go together.**

**You’ll find other hints on some of the problems too.**

**You may go ahead and get started and work until you get to the stop sign.**

<turn timer on; record how long solve block is (for all children to finish), and indicate time it takes for each child if feasible (but don’t write down their names!>

1. 3 + \_\_ = 10
2. 10 = 3 + \_\_
3. 3 + 7 = \_\_ + 5
4. 3 + 7 = \_\_ + 6
5. 3 + \_\_ = 8
6. 8 = \_\_ + 5
7. 3 + 5 = 4 + \_\_
8. 3 + 5 = 6 + \_\_
9. 9 + 6 = \_\_ + 5
10. 5 + 5 + 5 = \_\_ + 6
11. 5 + 6 + 4 = \_\_ + 4
12. 8 + 2 + 5 = 5 + \_\_
13. 6 + 4 + 3 = \_\_ + 3
14. What does the equal sign mean?

When finished: **Let’s look at #13 together. I want you to check your answer – but don’t erase it. 10 is the right answer to this problem.**

Provide encouragement while solving problems: **You’re doing a great job working so hard on these problems.**

*If students finish early*:

Have students go back and look over/check their work and show their work if they haven’t. As much as possible, have students continue to think about the problems the entire time.

If students are stuck/moving slowly:

“Remember, it’s okay if you aren’t sure about the correct answer. It’s still helpful to look at the problems carefully and think about them. Try thinking about what the equal sign means and if there’s a better way to think about what it means.”

Standard responses to struggling students during solve block:

How to respond if student makes discouraging statements like “This is too hard”

“I think you are doing a great job thinking about these problems.”

If student refuses to start a problem/give numeric answer:

“What can you do to get started?” OR “What numbers do you want to add first?”

If one student is taking a lot longer than the other students

If needed, we may need to stop before one of the students in a group has finished if he/she is taking more than 3 minutes longer than the rest of the students).

**MidTest**

**Memory Items:**

If they are holding their pencil, ask them to put it down.

**You all did a great job working hard and thinking hard about those problems. Next, we’re going to answer some different questions.**

**First, I’d like you to remember a problem for me. I’m going to show you it for just a few seconds. I don’t want you to solve the problem. Just look at it, and try to remember it. After I put the problem down, I want you to write the problem exactly as you saw it. Are you ready?** After 20 seconds, ask them to finish up.

Problem a: 5 + 4 + 8 = 5 + \_\_

**Okay, now we’re going to do one more.** (If needed: **Please put your pencil down). Try to remember this problem, and write it down after I take it away.** After 20 seconds, ask them to finish up.

Problem b: 7+ 5 + 2 = \_\_ + 3

True/False:

**Okay, please do the problems at the bottom of the page. I just want you to decide whether each of these number sentences is true. In other words, does it make sense? Circle True, False or Don’t Know.**

a) 8 = 8

b) 7 + 6 = 0

c) 31 + 16 = 16 + 31

d) 7 + 6 = 6 + 6 + 1

e) 8 = 5 + 10

f) 8 = 5 + 3

**Great! Please put down your pencils. We’re ready for the next part.**

**Turn back to the first page of problems in your packet**. (say no more about packet, but students may look at their packet during instruction – but be sure they don’t erase or change their answers.)

**INSTRUCTION BLOCK**

**Now, we’re going to think about what the equal sign means and look at a few examples together. Think about what you noticed when trying to solve the problems earlier.**

1) **If we look at a problem like this:** (hold up prompt)

**3 + 4 = 3 + 4**

**There are two sides to this problem,** (sweep gesture under side) **one on the left side of the equal sign and** (sweep gesture under side) **one on the right side of the equal sign.**

**The first side is 3 + 4** (sweep side).

**The second side is 3 + 4** (sweep side).

**The *equal sign*** (point) **means that the things on both sides of the equal sign are equal or the same** (sweeping hand back and forth). **So the left side of the equal sign always has the same amount as the right side of the equal sign.**

**You can answer all together. What is 3 + 4?** (Point to the left side of the equal sign. Wait for student responses.)

**The left side of the equal sign is equal to 7.**

**And what is 3 + 4 on the right side?** (Wait for student responses)

**The right side of the equal sign is equal to 7, too.**

**We have 7 on this side** (gesture around left) **and 7 on this side** (gesture around right). **Because we get the same amount on both sides, we can say that they are equal. If both sides are not the *same amount*, then they aren’t equal.**

2) **Let’s look at another example. Take a look at this:** (hold up prompt).

**4 + 4 = 3 + 5**

**What is on the left side of the problem?** ((Remind students can say it all together if needed. Wait for students to respond)

**Right, the left side is 4 + 4.** *(*sweep gesture – your gestures are very important!)

**What is on the right side of the problem?** (Wait for students to respond)

**The right side of the equal sign is 3 + 5.**(sweep gesture)

**Remember now, the *equal sign always* says that *both sides* have to equal the *same amount*.**

**So if we have 4 + 4 on the left, how much is on the left side?** (Wait for student response)

**The left side has 8.**

**So how much has to be on the right side?** (Wait for response)

**The right side has to be 8!**

**What is 3 + 5? (**Wait for response)

 **Right, 8.**

**Both sides have 8 so there should be an equal sign here. If they don’t have the same amount, then the two sides aren’t *equal, and there shouldn’t be an equal sign here*** (point).

3) **So if we look at a problem like this** (hold up prompt)**:**

**7 = 3 + 4**

**The equal sign still means that both sides are worth the same amount. The *equal sign* always means that the left side has the same amount as the right side. And it means that here, too. What is on the left side? (**Wait for response Switch to calling on different students if needed.)

**Right, 7.**

**We have 3 + 4 on the right. How much is on the right side?** (wait for response.)

**The right side has 7.**

**So, both sides are 7, and the equal sign tells us both sides have the same amount.**

4) **Now let’s look at something else. For example, if you saw something like this, would it make sense to write an equal sign here?** (Choose a different student and wait for response.)

**2 + 3 3 + 6**

**Good** (if say no) / **hmm, what do other people think?** (if say yes):

**What does the left side add up to?** (wait for student response)

**Correct, the left side has 5.**

**What does the right side add up to?** (wait for student response)

**Correct, the right side has 9**

**Are they the same amount?** (Wait for student response)

**No, they aren’t. The equal sign means that the left side is the same amount as the right side. Since these are not the same amount, then they are not *equal*, so it would not make sense to write an equal sign here.**

5) **Let’s look at one last problem, like the ones you tried to solve earlier** (hold up prompt)**.**

**5 + 4 + 3 = 5 + 🞎**

**What is on the left side of the problem?** (Wait for student response)

**The left side is 5+4+3.** (*gesture*)

**Now, what is on the right side.** (Wait for student response)

**The right side is *5 +* 🞎** (gesture)

**Again, the *equal* sign means that the left side (gesture) needs to be *the same amount as* the right side (**gesture**).**

If answer 7, be noncommittal, say “OK” and move on.

**Before we finish today, I want you to go back and check the problems that you solved earlier. Use a purple pen to make any changes and write a check mark if you don’t want to make any changes.** <Make sure all students check at least the first two pages of problems, preferably all problems. If there is one or two stragglers it’s fine to stop them.>

**I hope the equal sign makes a little more sense to you. Thanks for all your hard work today!**

**End of Session**