**ATME5b Fall 2013**

**Concepts Only Instruction – Solve Condition**

List to Bring to Session

Digital Voice Recorder

Scripts

Schedule

Student Response Packet (Problem Solving Block, Midtest)

Midtest and Instruction Prompts

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

File folder for putting collected data in

Consent Log/Master subject list

Purple Pens

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

***\*\*Turn on the digital voice recorder!\*\****

**WELCOME**

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

**Please write your first name.**

**CONCEPTUAL INSTRUCTION BLOCK PART 1**

**First, we’re going to think about what the equal sign means and look at a few examples.**

**1a) 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 first side of the equal sign and** (sweep gesture under side) **one on the second 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 amount** (sweeping hand back and forth). **So the first side of the equal sign always has the same amount as the second side of the equal sign.**

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

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

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

**The second 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.**

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

**4 + 4 = 3 + 5**

**What is on the first side of the problem?** (Remind students can say it all together if needed. If a student doesn’t respond, be sure to ask them what they think.)

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

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

**The second 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 first side, how much is on the first side?** (Wait for response.)

**The first side has 8.**

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

**The second 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).

**3a) 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 first side has the same amount as the second side. And it means that here, too.**

**What is on the first side? (**Wait for response. Switch to calling on non-participating students.)

**Right, 7.**

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

**The second side has 7.**

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

**4a) 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?** (Wait for response. Be sure that all students are participating and attending.)

**2 + 3 3 + 6**

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

**How much is on the first side?** (wait for student response)

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

**How much is on the second side?** (wait for student response)

**Correct, the second side has 9.**

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

**No, they aren’t. The equal sign means that the first side is the same amount as the second 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.**

**CONCEPTUAL INSTRUCTION BLOCK PART 2**

**Now we’re going to review what we just talked about the equal sign means, but with some new examples. This time I want you to do more of the talking!**

**1b) Let’s look at a new example:** (hold up prompt)

**4 + 2 = 4 + 2**

**There are two sides to this problem.**

**What’s on the first side of the equal sign?** (wait for response)

**The first side is 4 + 2** (sweep side).

**What’s on the second side of the equal sign?** (wait for response)

**The second side is 4 + 2** (sweep side).

**Who can tell me what the *equal sign*** (point) **means?** (wait for response)

Good (if correct)/ hmm, what do other people think?“ (if incorrect). Either way, say:

**The *equal sign*** (point) **means that the things on both sides of the equal sign are equal or the same amount** (sweeping hand back and forth).

**You can answer all together. How much is on the first side?** (Point to the left side of the equal sign. Wait for student responses.)

**Right, 6.**

**And how much is on the second side?** (Wait for student responses)

**Right 6, too. Do both sides have the same amount?** (wait for student responses)

**Yes, so we can say that they are equal. If both sides are not the *same amount*, then they aren’t equal.**

**2b) Let’s look at another example** (hold up prompt).

**5 + 5 = 6 + 4**

**What is on the first side of the problem?** (Remind students can say it all together if needed. If a student doesn’t respond, be sure to ask them what they think.)

**Good, 5 + 5.** *(*sweep gesture)

**What is on the second side?** Wait for students to respond)

**Good, 6 + 4.**(sweep gesture)

**­­Who ­­can remind us what the equal sign means?** (If needed, request different students until relational definition is given. Provide definition if needed.)

**You can answer together, how much is on the first side?** (Wait for response)

**Right, 10.** (sweep gesture)

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

**It has to be 10!**

**And what is 6 + 4? (**Sweep gesture. Wait for response.)

**Right, both sides have 10.**

**So does it make sense to have an equal sign here?** (Wait for response.)

**Yes! It does.**

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

**4 = 3 + 1**

**Does the equal sign mean the same thing on this problem as on the last problem?**

**Yes, it does!**

**What is on the first side of the equal sign? (**Wait for response.)

**Good, 4.**

**How much is on the second side?** (Wait for response.)

**Right, 4.**

**So, both sides are 4, and the equal sign tells us both sides have the same amount.**

**4b) Now let’s look at something else. Would it make sense to write an equal sign here?** (Wait for response. Be sure that all students are participating and attending.)

**5 + 4 2 + 3**

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

**How much is on the first side?** (wait for student response)

**Correct, the first side has 9.**

**How much is on the second side?** (wait for student response)

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

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

**No, they aren’t. Can you use an equal sign if the two sides are not the same amount?**

**No, it would not make sense to write an equal sign here** (point)**.**

**5) Let’s look at one last problem,** (hold up prompt)**.**

**5 + 4 + 3 = 5 + 🞎**

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

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

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

**The second side is 5 +🞎** (gesture)

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

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

**MANIPULATION CHECK**

**Okay. Thanks for listening so carefully to our lesson about the equal sign. Now we’re going to move on to our next activity. I want you to try and solve some math problems on your own. Turn to the first page in your packet.**

**Find the number that goes in the box to make the number sentence true. Think about what the equal sign means when you solve the problems.**

1. 3 + 6 + 2 = 3 + \_\_
2. 2 + 8 + 3 = \_\_ + 3

**MIDTEST**

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

**Memory Items:**

**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.**

**So please put your pencils down now. Remember, after I take the problem away write down exactly what you saw. Are you ready?**

Show problem for 5 seconds. After 20 seconds, ask them to finish up.

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

**Okay, now we’re going to do one more. Please put your pencil down. Try to remember this problem, and write it down after I take it away.**

Show problem for 5 seconds. After 20 seconds, ask them to finish up.

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

True/False:

**Okay, please do the problems on the next 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 d) 7 + 6 = 6 + 6 + 1

b) 7 + 6 = 0 e) 8 = 5 + 10

c) 31 + 16 = 16 + 31 f) 8 = 5 + 3

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

**SOLVE BLOCK**

**Now, 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. Please turn to the next page.**

**For each problem, you need to figure out the number that goes in the box to make the number sentence true. While solving the problems, think about what we just talked about the equal sign means.**

**You may go ahead and start.**

<record start and stop times for each child on data collection sheet>

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. 11 = 4 + \_\_
10. 4 + 7 = 3 + \_\_
11. 6 + 2 + 3 = \_\_ + 8
12. 4 + 2 + 5 = 5 + \_\_
13. 9 + 6 = \_\_ + 5
14. 5 + 5 + 5 = \_\_ + 6
15. 5 + 6 + 4 = 4 + \_\_
16. 8 + 2 + 5 = \_\_ + 5
17. 6 + 4 + 3 = 3 + \_\_
18. What does the equal sign mean?

As each student finishes: **Go back to the first page of problems, page 4. I want you to check your work on all the problems. Use a pen** (hand student a pen) **to make any changes and write a check mark if you don’t want to make any changes.** <Make sure all students check all problems and DON’T ERASE ORIGINAL ANSWERS.>

When all students are finished checking: **Let’s look at #17 together. I want you to check your answer – but don’t erase it. 10 is the right answer to this problem.**

**I hope these problems makes a little more sense to you. Thanks for all your hard work!**

HELP GUIDELINES FOR SOLVE BLOCK:

*If students are stuck/moving slowly or struggling:*

“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.” OR “If you really aren’t sure about a problem, it’s okay to write a question mark and move on.”

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

*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 taking too long:*

In extreme circumstance, stop after 30 minutes in the solve block, even if all students in a group have not finished. This is rare.

**End of Session**