

| | |
|--|---|
| Description: Early Algebra Ideas Involving One Variable: Clip 1 of 11, Open Sentences: True, False, Legal, Illegal Parent Tape: Early Algebra Ideas Involving One Variable Date: 1993-09-30 Location: Harding Elementary School Researcher: Robert B. Davis | Transcriber(s): Spang, Kathleen Verifier(s): Yedman, Madeline Date Transcribed: Fall 2010 Page: 1 of 3 |
|--|---|

| Time | Speaker | Transcription |
|------|---------|--|
| | Davis | I want to look first at something , Jeff, everybody I want to look first at something which is important to mathematicians. They talk a lot about true statements and false statements and they usually say open sentences and I want to make sure we agree on what they are. If I wrote three plus box equals five [Off camera: Davis wrote $3 + \square = 5$], which do you suppose they would call it? True or false or open? |
| | Jeff | Open. |
| | AmyLynn | Open. |
| | Davis | You are right. I don't know how you know but you are right. Hum, could you tell me something that I could write in the box that would make a false statement, Brian? |
| | Brian | Uh, five. |
| | Davis | Five, Okay. I write 5 in the box so it says three plus five equals five. [Off camera: Davis wrote $3 + \square = 5$] and I take it that we agree that is false. Yes. |
| | Student | Uh hum. |
| | Davis | Okay, so usually what the people want us to do is to write something in the box that will make a true statement which I am sure you anticipated. Michael, what would that be? |
| | Michael | Two |
| | Davis | Two and to keep track of it [Off camera: Davis points to \square], this is often called the truth set [Off camera: Davis points to $\{ \}$] and I am going to write it here [Off camera: Davis wrote 2 in the box \square and erased it.] You can think that I wrote it in the box but sometimes it is nice to keep the box empty so we can write other things in it so I am going to write the 2 there [Off camera: Davis wrote $\{2\}$] and this is called a truth set and what that says is that if I put 2 in the |

| | |
|--|---|
| Description: Early Algebra Ideas Involving One Variable: Clip 1 of 11, Open Sentences: True, False, Legal, Illegal Parent Tape: Early Algebra Ideas Involving One Variable Date: 1993-09-30 Location: Harding Elementary School Researcher: Robert B. Davis | Transcriber(s): Spang, Kathleen Verifier(s): Yedman, Madeline Date Transcribed: Fall 2010 Page: 2 of 3 |
|--|---|

box, I'll have a true statement. We all agree on how that works.

Davis Okay, well I want to try another kind of problem here. There is something that some Mathematicians call the rule for substituting and it says [Off camera: Davis writes $+ = 8$] it says, if you have more than one box, whatever number you put in the first box, you got to put the same number in all of the boxes. Okay, now if you do that you've made a legal substitution. If you don't do that you have made an illegal substitution. Now what I'd like you to do is make a legal substitution that would produce a false statement.

Jeff Oh, six, six.

Davis Six. Where do you want me to write the six?

Student Put six plus six equals eight.[Off camera: Davis writes $\boxed{6} + \boxed{6} = 8$]

Davis Okay, was that legal?

Jeff No. Yes, it was legal.

Brian Yes it was.

Jeff But it was a false statement.

Davis Six plus six equals eight true or false?

Brian False.

Davis That's what he wanted to do so it worked. Okay, so that was legal and it produced a false statement. [Off camera: Davis wrote legal and false under $\boxed{6} + \boxed{6} = 8$]. Now what I'd like you [Off camera: Davis erases the number 6 in both boxes] to do now is make an illegal substitution that will produce a true statement. Michael?

Michael Six and two.

Davis Okay. Six here and a two here. [Off camera: Davis writes $\boxed{6} + \boxed{2} = 8$] Okay, is that legal or illegal?

Michelle I Illegal.

Brian Illegal.

Davis Illegal because he didn't put the same number in both boxes.

| | |
|--|---|
| Description: Early Algebra Ideas Involving One Variable: Clip 1 of 11, Open Sentences: True, False, Legal, Illegal Parent Tape: Early Algebra Ideas Involving One Variable Date: 1993-09-30 Location: Harding Elementary School Researcher: Robert B. Davis | Transcriber(s): Spang, Kathleen Verifier(s): Yedman, Madeline Date Transcribed: Fall 2010 Page: 3 of 3 |
|--|---|

Jeff What does that say?
 Michelle I [Inaudible.]
 Davis But the statement he got is true. [Off camera: Davis writes illegal and true under $+$ $= 8$] Hum, could [Davis erases the 6 and 2 in the boxes] you make it wrong both ways. Make an illegal substitution that produces a false statement. Bobby?
 Bobby Six plus eight.
 Davis Eight. Six plus what?
 Bobby Eight.
 Davis Eight. [Off camera: Davis writes and under it illegal, false] How about that?
 Jeff It could be better.
 Davis He did what he wanted it to do and it is illegal because he doesn't have the same thing in both boxes.
 Michelle I Like fifty.
 Davis And the statement six plus eight equals eight
 Jeff That was really good.
 Davis Is certainly false.
 Jeff I have to think of these.
 Davis Okay, somebody ask the next question? [Off camera. Davis erases the 6 and 8 from each box.]
 Jeff Someone ask the next question?
 Davis Yeah. Brian.
 Brian Can you like take a legal substitution and have a true answer?
 Davis Yeah, can you make a legal substitution and get a true statement?
 Ankur Four and Four.
 Jeff Way to go Ankur.
 Davis Yeah. Sure and so if I use this system of the truth set, I can write a 4 here [Off camera: Davis writes { 4 }] and what is that telling me? It is saying to put four in all of the boxes and it will be true.
 Jeff Yes.
 Davis Is that okay? Is that alright?