## Building a Playground Task
Teacher: Debra Campbell
District: Hamilton County School District
Grade: High School

1	*Teacher:*	So, okay, how did you come up with 3 points?
2	*Student:*	Well, first I did the midpoint formula.
3	*Teacher:*	So where's the midpoint? Did you guys agree?
4	*Student:*	Yeah.
5	*Teacher:*	Okay. So that's the midpoint, so that's how many points does that represent?
6	*Student:*	It makes one.
7	*Teacher:*	One. So, where's the other points at?
8 9	*Student:*	And then I drew a square because, you know, all the points are going to be equidistant from each side if it's a square.
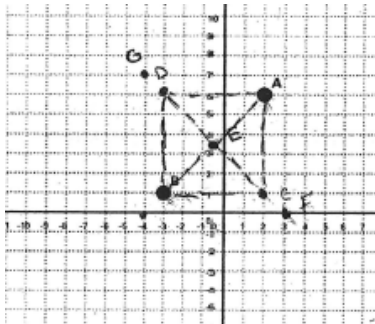
| 11	*Teacher:*	How did you draw a square? Where's your square at?
12	*Student:*	Right here.
13	*Student:*	And mine, too. Like here.
14 15	Teacher:	So did you do – was your thinking the same way as hers? So are those the only points?
16	*Student:*	Uh, no, there could be more points.
17 18	*Teacher:*	Could you prove to me – I'm going to come back and see if you guys can prove to me that there could be more points?

19		*(Moves to new group)*

20   So tell me, did you guys find that midpoint formula? Okay, so how are you using
21   that midpoint formula to make sense of this problem?

22 *Student:*   It seems like if you go, no matter where you go, as long as it's the same – as long
23   as you know what the midpoint is, it's going to help you get back to where you
24   also get equal distance.

25 *Teacher:*   So, where are your 3 points? Could you point to me – could you turn your page 2
26   to there? So where are your 3 points?

27 *Student:*   I really –the line just peaked. (*Points to a vertex on the square*).
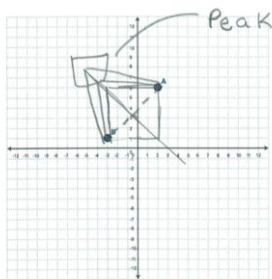
28 *Teacher:*   So what does that line mean? I'm going to come back to that. I want you to be
29   able to tell me what does that little line mean.

30   *(Moves to new group)*

31   When we talked about – are there more points? Did you come up with more
32   points?

33 *Student:*   First I got the slope of both of these. I did – I tried - I got a slope for both of
34   them.
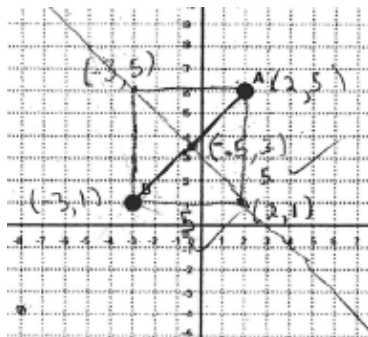
36 *Teacher:*   So what does the slope help you determine?

| 37	*Student:*	Where – like can it determine like the midpoint of it or something like that.
38	*Teacher:*	So you're finding the slope. What does the slope help you determine?
39	*Student:*	It helps me determine where they're going to meet in the middle and that's what
40		I'm thinking. What – not only – at first I was thinking about finding the midpoint
41		of it to see how could I [*inaudible*] around that and it got to thinking like you
42		don't just find the midpoint. Thinks of the slope. I found the slope.
43	*Teacher:*	Okay. So you're going to have to tell me how you can use that slope. I'm going to
44		come back and ask you how can you use that slope.
45		*(Moves to new group in which the students have connected the point they've*
46		*determined to be solutions for the problem)*
47		But how did you construct that line? How do you construct that line? Is it a
48		curved line? Is it – how do you construct it?
49		*(Moves to new group)*
50		So, did you come up with three points?
51	*Student:*	Mm-hmm.
52	*Teacher:*	Did you come up with more than three points?
53	*Student:*	Joe did.
54	*Teacher:*	Can there be more than three points? Why?
55	*Student:*	Because it's – I don't know how to explain it, but I know what I mean.
56	*Teacher:*	Is there a pattern that you're noticing if there's more than three points? Be
57		ready to tell me about what pattern do you see. If there's more than three
58		points, what can you tell me about the pattern of seeing those three points?
59		*(Moves to new group)*
60		How did you know how to draw your line? *[Refers to line in red in the drawing*
61		*below.]*
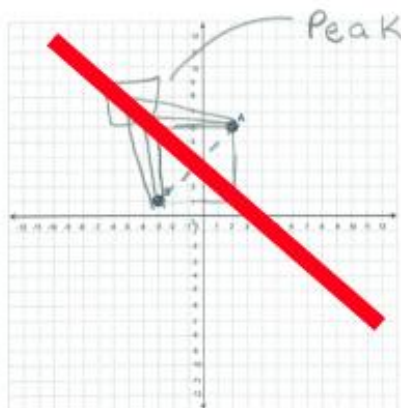
62	*Student:*	They are perpendicular to the other.
63	*Teacher:*	What do you mean perpendicular? What does it mean when it's perpendicular?
64	*Student:*	It makes a 90-degree angle.
65 66	*Teacher:*	Oh, so you're making some 90-degree angles, and so what do you know else about that perpendicular line?
67	*Student:*	If it passes in the midpoint, don't it?
68	*Teacher:*	Oh, very good. So don't forget that when we come to our discussion.
69		*(Moves to new group)*
70		Let's see, so why – are there more than those?
71	*Student:*	No.
72	*Student:*	Yes.
73	*Student:*	Oh yeah, we – there's one more.
74	*Teacher:*	So you're saying that how many points altogether do you see?
75	*Student:*	Four.
76	*Teacher:*	Four points, so that's all the points that you can see?
77	*Student:*	I think I see another one, two, three, four, five, six, seven. Yeah, seven.
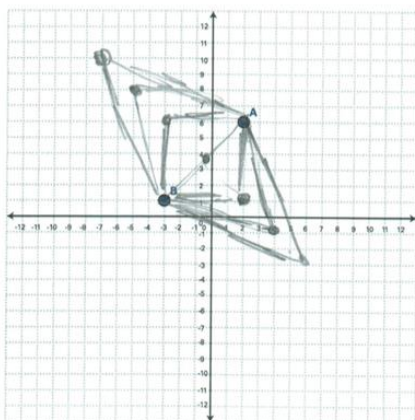
74	*Teacher:*	
75	*Student:*	That's what I think. That's what I think too.

| 76 | *Teacher:* | Okay, so if I wanted to build just – just a sec. I wanted to build the playground |
| 77 | | like 10 miles away from – |

| 78 | *Student:* | A and B? |

| 79 | *Teacher:* | Yes. Could I do that? |

| 80 | *Student:* | You could. |

| 81 | *Student:* | You could, yeah. |

| 82 | *Teacher:* | Could I do that? |

83	*Teacher:*	How would I do that? What if I wanted to – 'cause I wanted people on the other
84		side of town also so could I build it so there's – it would be equal distance and
85		it's 10 miles away?

| 86 | *Student:* | Yes 'cause the extended lines. |

| 87 | *Teacher:* | Oh, what? I heard something. You might want to talk to them about it. I'm |
| 88 | | coming back over here. |

[End of Audio]