



**CREATIVE TECHNOLOGY
RESEARCH LAB**

**COLLEGE OF EDUCATION
UNIVERSITY OF FLORIDA**

**The Collaborative Computing
Observation Instrument (C-COI)
Code Book**



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REFERENCES

General References:

STUDENT (S): refers to the participant you are observing/analyzing the screencast data for

PEER (P): the observed participant's classmate/peer/friend (Add notes about P1 vs student ID)

ADULT (A): the researcher/instructor/teacher/paraeducator/volunteer

DIFFICULTY/PROBLEM: refers to the specific question that a participant proposes or a specific problem during a computing task. It is NOT referring to the general computing task.

NOTE: Several codes were removed but the remaining codes were not renumbered. The following codes do not exist: 2, 8, 10, 11

NOTE: While coding a video, always triangulate with field notes of what the student was doing in the classroom.

Different types of interactions captured by the CCOI:

- » Computing-problem solving
- » Computing-non problem solving
- » Non computing
- » Self regulation

Independent work:

- » Student is working on their own on either a computing or non-computing task.
- » Code independent work when there is at least 30 seconds of the student engaging in independent work without any interaction with an adult or peer. Check the field notes to ensure there is no interaction.
 - Exception #1: at the beginning of the video, you may code independent work even if less than 30 seconds.
 - Exception #2: if an interaction leads a student to go back to a separate problem that they previously did not solve and work on it independently, you may code independent work even if less than 30 seconds.
- » For all independent work, take careful field notes. These will be used to create "independent work" subcodes in the future.
- » If the student is engaged in self talk, transcribe this self-talk and describe what is happening on the computer screen.

To document clearly at some point:

Path != Problem, i.e. 1 interactive path can have multiple conversations/problems/discussions, as long as the same people are involved. For example, if a student and teacher work through 2 different problems as part of an uninterrupted conversation, they would both be part of the same path.

One off:

(This rule does not apply in problem solving, self-regulation support, student's dissatisfaction or frustration, student's offering help to peer, and/or redirection of class/task. Refer to Node 1-7...)

- » Student says something, and peer answers with short response which ends the interaction. Do not code.

Some other language around one-offs:

- » Pattern of interactions: [TENTATIVE] if you see three one-off interactions of any kind within three minutes, code all one-off interactions, and keep coding future one-offs until three minutes have passed without a one-off.
- » Engagement in a conversation requires that there is a back and forth among at least two parties. See rules for one-offs.

CODE NAME 0

Code Name	Description	Examples (actions/words)	Other Rules
(0) How does the event begin?			
<p>0-0: Student addresses peer</p> <p>0-2: Student addresses adult</p>	<p>Beginning of an interaction where the student whose data we are analyzing addresses a peer, adult, or group of people</p>	<p>Help seeking:</p> <p>"Hey, can you help me?"</p> <p>"Rachel, can you help me?"</p> <p>"I need help." (especially if followed by more directed help seeking behavior)</p> <p>S: "Ms. X, can you help?"</p> <p>A: "Okay let's see. [turns to class management] Everyone needs to work at voice level one! [turns back to the student] Okay, what did you change?"</p> <hr/> <p>Computing related Comment (Excitement, frustration, general conversation):</p> <p>"Rachel, look what I did!"</p>	<p>» Ten second rule:</p> <ul style="list-style-type: none"> • If any independent work takes place between interaction attempts (end of one attempt to the start of the next), code as two separate interactions with independent work between • Else if >= 10 seconds between attempts, code as two separate interactions • Else, code as same interaction <p>» Incidental interactions</p> <ul style="list-style-type: none"> • One call-and-response socialization interaction does not get coded. A more extended interaction, or a pattern of short interactions, do get coded. • Pattern of interactions: [TENTATIVE] if you see three one-off interactions of any kind within three minutes, code all one-off interactions, and keep coding future one-offs until three minutes have passed without a one-off. • Support seeking/offering behavior is always coded unless it's potentially self-talk in the form of a question. <p>* If adult/peer leaves temporarily and comes back to the conversation that the student has started, code as same interaction instead of 0-1 and 0-3.</p>

<p>0-1: Peer addresses student</p> <p>0-3: Adult addresses student</p>	<p>Beginning of an interaction wherein a peer or an adult addresses the student whose video we are analyzing.</p>	<p>P: Hey, that's cool. How'd you do that? Student responds</p> <p>P: Hey, Can you help me with this? Student responds</p> <p>A: Hey, that's cool. How'd you do that? Student responds</p> <p>A: "Hey, can you get back into the project?" S: "I'm stuck. It's too hard." A: "Ok. Let's see what's going on."</p>	<p>» Don't code initial exposition interaction ("What is your computer number, what are you working on") unless:</p> <ul style="list-style-type: none"> • Interaction lasts more than a minute • Interaction moves to a problem ("How do I log in?" "are you seeing this movie this weekend?"). Then timestamp/start coding when the student asks for help. • If confused whether student is help-seeking or self-talking, look for evidence of an interaction attempt. If no evidence exists, code as independent work.
<p>0-4: Student works independently on a computing related task</p>	<p>Beginning of independent path</p>	<p>Student is working on their computer doing work related to the task. The student may or may not use self-talk.</p> <p>S: "Oh geez. That didn't work. Hmmm. Ok." No response from anyone.</p> <p>Student works on asset development and management: E.g. Looks for an image or sound for their computational artifact</p> <p>Refer to node 3 on categorization of the nature of task.</p> <p>An example can be a task on academic content, navigating software (e.g. logging in, changing levels), asset creation and management (e.g. creating/modifying/resizing images, recording/editing audio), general computer technology (e.g., mouse, monitor, adapter)</p>	<p>Code as soon as student starts working independently on task (as soon as mouse moves), end path when evidence of independent computing work ends (e.g. interaction begins, student works independently on non-computing task, mouse stops moving for 30 seconds, video ends)</p> <p>The mouse may or may not be moving. (e.g, student may be watching a tutorial)</p> <p>*Take field notes about what the student is doing while working independently including: What they are working on, if they are engaged in self-talk, what are they saying (e.g., steps, frustration expression)</p>

<p>0-5: Student works independently on a non-computing task</p>	<p>Beginning of independent path</p>	<p>Student is on Minecraft while the class is doing a Scratch activity.</p>	<p>This code refers to any off-task type behaviors. The student is not working on the expected computational activity. Take field notes on what the student is doing.</p>
<p>0-6: Student joins peer conversation</p>	<p>The student is heard (on their computer and/or that of a peer being observed) joining into a peer's conversation with a third party. Evidence may also exist in observation field notes.</p>	<p>S: "What did you just say about how you solved that puzzle?" Peer responds S: "I was thinking about trying to make a maze game too. How many sprites do you have?" Peer responds</p>	<p>Engagement in a conversation requires that there is a back and forth among at least two parties. See rules for one-offs. There has to be evidence of at least 3 people involved.</p>

CODE NAME 1

Code Name	Description	Examples (actions/words)	Other Rules
(1) How does the interaction with the peer or adult begin or continue? (Start timestamp as soon as the interaction begins)			
<p>1-0: Student clearly expresses how he or she needs help with a difficulty or problem</p>	<p>Two elements must be present for this code:</p> <ol style="list-style-type: none"> 1. A statement or request for help, and 2. Some explicit description of what the student needs help with. 	<p>For example:</p> <p>S: I found a bug, I just don't know how to fix it.</p> <p>T: Oh, o.k. (Teacher stops to do whole class and individual redirection)</p> <p>T: O.k., so you found the problem. So what is the problem?</p> <p>S: There is 3 instead of 1 on Mars (?) Three instead of one.</p> <p>T: O.k., so where does the program tell it how many moons to put?</p> <p>In this interaction, the student did not explicitly say what the problem was at the beginning of the interaction, but with prompting and scaffolding, she explained the problem. Therefore, it was decided this instance was coded 1-0.</p>	<p>Code the timestamp as soon as the student asks for help, but choose between 1-0 and 1-1 after hearing more of the interaction.</p> <p>Take into consideration the interaction that follows the timestamp while deciding which code to choose. In other words, the chosen code should reflect the initial discussion that follows instead of considering only the very first sentence the student says. See below.</p> <p>In Scratch: Student needs to verbally express the problem that they need help with, even if they only express it after prompting. ("I want to make the guy go 'rwaaaah"). Otherwise code 1-1. "It's not working" is an example of not clearly articulating the problem.</p> <p>Student may seek attention ("Hi Mr. Lash") first without articulating the problem in the first utterance ("I need help"). If student then clearly expresses the problem with scaffolding, code 1-0.</p> <p>Clear expression should happen either in the initial call for help or after the peer/adult asks, "what's up/ what are you trying to do?"</p> <p>If the student only expresses the problem after discussion with adult/peer, this option will never get selected for this problem discussion.</p>

<p>1-1: Student expresses a need for help, but is not explicit to the difficulty or problem</p>	<p>Student is heard asking for help (not self talk)</p>	<p>“Can you help me?” “Rachel, help me!” “Mr. Gibson, It’s not working.” (Directed at a peer or adult)</p> <p>Non-example: S: “It’s not working.” “I don’t know what’s going on.” No response from a peer/adult, no observation record of addressing peer/adult</p>	<p>See 1-0</p> <p>Rule: The student clearly addresses a peer or adult. There has to be some evidence that the student is addressing someone and not engaged in self-talk.</p> <p>If it is unclear whether the student is engaging in self talk vs. attempting help seeking, do not code as help seeking.</p>
<p>1-2: Student discusses computing (not problem solving)</p>	<p>Discussing anything related to the computing task or about any computation that is not a problem.</p>	<p>Examples: “Look at what I did. It’s a black hole. I made a black hole.” “This is cool. How did you make that?”</p> <p>Non-Examples: “I can’t log in” (problem related interaction or self talk) “Hmm, I wonder why this isn’t working” (problem related interaction or self talk) “What did you do this weekend?” (Non-computing conversation)</p>	<p>Evidence that the student is addressing a peer/adult and not engaged in self-talk.</p> <p>No evidence of a problem-related conversation.</p>

<p>1-3: Student engages in non-computing conversation</p>	<p>Non-computing is a conversation outside the scope of anything related to computing/coding. It can be conversations about the weather, a person, an event, etc.</p>	<p>Examples: S: "What happened to Rachel?" P: "I don't know. Maybe she went to the bathroom." S: "I really liked her necklace." P: "Yeah, I want one."</p> <p>Non Example (one off): S: "Pretty necklace!" P: "Thanks." End of conversation.</p>	<p>Code as "non-computing" when the student and a peer/adult have a conversation that involves some back-and-forths.</p> <p>If no one responds to the student or gives a short answer such as "yes/or" or "I don't know", then it may be omitted.</p> <p>Do not code if it's a "one off" = Student says something, and peer answers with short response which ends the interaction.</p> <p>One off rule: Student says something, and peer answers with short response which ends the interaction. Do not code.</p>
<p>1-4: Student offers support to peer (the peer did not specifically ask for help)</p>	<p>The student offers unsolicited assistance to a peer as heard in the audio recording. Visual evidence may be that the student stops working on their own computer.</p>	<p>S: Looks like you need help, yo? S: "Oh! I've done that before. You have to change the orientation of your sprite." P: How do I do that? S: Click on the sprite first on the bottom right of the screen and then change where it says, direction. P: Oh, right there?</p>	<p>Note that this is different than the peer asking the student for help. Only code if the offer for help is unsolicited.</p>
<p>1-5: Student says something that is unclear or inaudible</p>	<p>Coder is unable to discern what the student says. This may be due to background noise, the student speaking softly or other reason such as those having to do with tech issues.</p>	<p>S: I really (inaudible). I wish someone would (inaudible) jars of pickles.</p>	<p>Choose this code if you cannot discern what is said or are not sure. In the field notes, add what you think may have been said.</p>

<p>1-6: Student verbally addresses a person without expressing the offer or need for help, curiosity, excitement, accomplishment or socialization (e.g., “Hey you...” or “Mrs. S...” or “Stop that!”)</p>			
<p>1-7: Peer offers self-regulation support to student Describe the support in the field notes.</p>	<p>While support is offered, it is not directly related to computing. This may include cheering a friend on, giving them positive affirmations, reminding them of a strategy for helping them to focus, etc.</p>	<p>P: “I know it is really hard. I know you can do it. Do you need to take a break?”</p>	<ul style="list-style-type: none"> » One-off rule does not apply (just as in problem solving) » Code if the interaction is peer driven (e.g., the peer initiated the discussion). » Code if the support is related to self-regulation. This is not direct support in solving a computing problem on its own but may be related to a student expressing or showing frustration or difficulty with such a problem.
<p>1-8: Peer offers support to student who was working collaboratively on a problem or topic</p>	<p>A third party peer joins in to an existing instance of collaboration to offer further support.</p>	<p>S: I think we need to use a conditional statement here. P1: Why do you think that? P2: You are trying to have the car sense the wall of the race track right? “If hits wall, then bounce.” Make sense right? S: See, that is a conditional!</p>	<p>Code if the interaction is peer driven and the peer initiated the discussion.</p>

1-9: Peer offers support to student who was working independently on a problem or topic	A peer verbally offers computing-related support or help to the student being observed.	P: Looks like you are stuck. I've done that level. Need help? S: Sure, I've been working on this forever.	Code if the interaction is peer driven and the peer initiated the discussion.
		Non-example: P: Do you want to walk to the water fountain to cool off a bit before we continue?	Do not use this code if the peer is offering self regulation help.
1-10: Peer discusses computing (not problem solving)	A peer verbally addresses the student being observed and discusses some aspect of either the student's or the peer's computing activity, not related to a problem.	P: I love changing the speed my sprite glides by to make it really fast. Its hilarious!	Code if the interaction is peer driven and the peer initiated the discussion. No evidence of a problem solving interaction.
1-11: Peer engages student in non-computing conversation (heard on student's computer)	A peer verbally addresses the student being observed and discusses something not related to computing (off task).	P: Whatever we are having for lunch smells awful! S: Ya, I think I am going to barf. Glad I brought my own lunch. P: I wish I did :(Code if the interaction is peer driven and the peer initiated the discussion. These conversations are outside of anything related to the classroom computing activity.
1-12: Peer asks student for help	A peer verbally requests help from the student being observed/ recorded.	P: "Hey, how'd you do that? I can't make the triangle."	Consider this problem-solving. So the One-off rule does not apply.

<p>1-13: Peer says something that is unclear or inaudible</p>	<p>A peer verbally addresses the student being observed but what is said is unclear or inaudible due to background noise, technical issues or the volume of the peer's voice.</p>	<p>P: I'm...(inaudible) Ashtanga Yoga... (inaudible) and a fish sandwich! S: Totally. I'm down with that!</p>	
<p>1-14: Peer verbally addresses the student without expressing the need/offer for help, curiosity, excitement, accomplishment or non-computing conversation (e.g. "Hey you..." or "Can you stop that!")</p>			
<p>1-15: Adult offers self-regulation support to student Describe the support in the field notes.</p>	<p>Self regulation strategies offer students support in either monitoring their own learning, helping with dealing with frustration, and working with their peers.</p>	<p>"Take a deep breath and keep trying, you are almost there." "OK, what do you need to help you get back on track?" "Let's look at your project plan and see what you can do next."</p>	<p>While support is offered, it is not directly related to specific computing problem solving. This may include cheering the student, giving them positive affirmations, reminding them of a strategy for helping them to focus, etc. This code is used if the adult is helping the student work with a peer/peers.</p>

<p>1-16: Adult offers support to student who was working collaboratively on a problem or topic</p>	<p>This is when the adult joins the conversation to offer support when the student and a peer are knowingly working collaboratively.</p> <p>This support can be either general problem solving or self-regulation support.</p>	<p>“What are you two doing to get the sprite over the rock? Do you need any help with that?”</p> <p>S: “myFolder, stop touching me, It’s not nice!”</p> <p>Teacher intervenes: “Let’s see if we can get you to work together a little better. Why don’t you take turns with who’s the navigator during your pair programming?”</p>	<p>Add/refer to field notes about what is happening in the collaboration.</p> <p>This support can be for programming, asset development/management, or any other computing-related task.</p> <p>One-off rule does not apply because this is considered problem solving.</p>
<p>1-17: Adult offers support to student who was working independently on a problem or topic</p>	<p>Adult is heard offering the student support (not self-regulation) in solving their computational problem. Student is not heard asking for help.</p>	<p>T: “You’ve been working on that for a while. Let’s see if I can help a bit. What would happen if we moved that block into the repeat loop?”</p>	<p>Here, the student must be knowingly working independently. Add/refer to field notes about the nature of the situation.</p> <p>One-off rule does not apply because it’s problem solving.</p> <p>This support is not self-regulation in nature.</p>
<p>1-18: Adult engages in non-computing conversation [heard on student’s computer]</p>	<p>Adult is in conversation with the student about any topic unrelated to the computing task.</p>	<p>T: Did you finish your math module?</p> <p>S: Not yet. I want to do my art assignment first.</p> <p>T: When are you planning on finishing it?</p> <p>S: After recess.</p> <p>(e.g., student has to finish a math problem, check recording, go to another room)</p>	<p>This code can be used both for general conversations or for problem-solving unrelated to computing.</p> <p>One-off rule does apply here.</p>
<p>1-19: Adult verbally comments on student’s work [heard on student’s computer]</p>	<p>Adult verbally addresses the student being observed and discusses some aspect of the student’s computing activity, not related to a problem.</p>	<p>A: “Oh dang. You made that dragon HUGE. Cool.”</p> <p>S: “Yeah, check out how I also made it dance!”</p> <p>A: “Nice. I wonder if you can make it dab?”</p> <p>S: “Ha, Ha. That’s so lame and 2018.”</p>	<p>Code if the interaction is adult driven and the adult initiated the discussion.</p> <p>No evidence of a problem solving interaction.</p>

<p>1-20: Adult engages in non-computing conversation [heard on student's computer]</p>	<p>Difference with 1-18?</p>		
<p>1-21: Adult says something that is unclear or inaudible</p>	<p>Coder is unable to discern what the adult says. This may be due to background noise, the student speaking softly or other reason such as those having to do with tech issues.</p>	<p>A: I really (inaudible). I wish someone would (inaudible) jars of pickles.</p>	<p>Choose this code if you cannot discern what is said or are not sure. In the field notes, add what you think may have been said.</p>
<p>1-22: Adult verbally addresses the student without expressing the offer for help, curiosity, excitement, accomplishment or non-computing conversation (e.g., "Can you please stop that!")</p>	<p>(How is this different than self-regulation support?)</p>		
<p>1-23: Adult directs student to a computing task</p>	<p>This code essentially refers to the adult redirecting the student away from a non-computing task, toward computing related work.</p>	<p>A: "Hey Lando, finish up your tunacolada, throw it away and come help me figure out how to finish this Angry Bird puzzle." S: "O.k., cool. I'll be right there."</p>	<p>Use this code only when the teacher is redirecting the student back to being on-task for the computing activity. One-off rule does not apply.</p>

<p>1-24: Student's cursor stops moving for more than 30 seconds, or the student leaves station (> 30 seconds) and returns to independently work [end path]</p>	<p>Student's cursor stops moving because student stopped working on what they were doing. No conversation is heard.</p>	<p>Student moves to another student's computer. Student stops working. No evidence of computing-related "off computer" work.</p>	<p>Refer to the field notes whether student is required to finish paper-based task with a peer, which is likely why student's cursor stops moving. In such a case, do not code this choice but keep coding it as interaction.</p> <p>There may be multiple reasons for the mouse to stop moving (e.g., student watches a video in the computing environment, student works on pseudocode on paper, student goes to peer's computer). Only use this code if the student leaves the computer or is clearly off task. Do not use this code if the student is watching a relevant video or doing something off-computer that is related to the computing task.</p>
<p>1-25: Interaction terminates [end path]</p>			<p>Select when no answer from peer or adult is heard. Timestamp as soon as the last words spoken. Wait 30 seconds to make the judgement about whether the interaction ends.</p>
<p>1-26: The video record ends [end path]</p>	<p>Videorecording stops.</p>		

CODE NAME 3

Code Name	Description	Examples (actions/words)	Other Rules
<p>(3) What was the problem? (This is referring to the difficulty not the subtask)</p>			
<p>* In field notes, describe the specific problem the student is facing (e.g., trying to make the penguin blink in Scratch). This code may be difficult to tell until watching the video for a while. Sometimes it seems that there is one difficulty, but the video continues and the problem may be need to be reevaluated.</p>			
<p>3-0: Difficulty or problem or topic is related to programming.</p>	<p>Difficulty related to understanding the programming blocks (e.g., how to repeat, use conditional, etc.), or use other features that result in a student wanting to do a specific computing task (e.g., shrink a sprite, finding a Sprite in Scratch).</p>		<p>In Scratch, there are challenges with understanding the blocks, understanding order of blocks, etc. There are other features in the interface such as shrink that can also influence the program and should be considered computing/programming challenges.</p>
<p>3-1: Difficulty or problem or topic is related to academic content</p>	<p>The difficulty/problem is pertaining to the subject area of interest, such as math or science. Decide what the content area of interest is before you decide if a problem/topic is related.</p>	<p>If math is the content area of interest, then not knowing that a right angle is 90 degrees is related to "academic content".</p> <p>If science is the content area of interest, then it may be considered as related to computing/programming.</p>	<p>Tentative: IF trying to decide between computing/programming and academic content, choose computing/programming unless academic content is keeping student from being able to perform project.</p> <p>A spelling question wouldn't qualify; a misunderstanding about angles that prevents the student from solving a code.org would qualify.</p> <p>If the student specifically asked a question about academic content, code academic content.</p>

<p>3-2: Difficulty or problem or topic is related to navigating software.</p>	<p>The difficulty/problem pertains to understanding how the programming software runs. Once a student logs into the program and demonstrates basic interface navigation, this code will be less likely to appear.</p>		
<p>3-3: Difficulty or problem or topic is related to asset creation and management</p>	<p>Student has difficulty creating/modifying/resizing images, recording/editing audio</p>	<p>e.g. , Working on the visuals of a sprite instead of the code Student can't find where the sprites are in the Scratch environment,</p>	
<p>3-4: Difficulty or problem or topic is related to general computer technology</p>	<p>Student has difficulty using the computer in general. This is unrelated to programming or navigating software.</p>		<p>Indicate the relevant categories in the field notes using the following keywords:</p> <ul style="list-style-type: none"> • computing/programming • academic content • navigating software • general computer technology • other
<p>3-5: Difficulty or problem or topic is related to multiple of the above categories</p>	<p>Student is having difficulty across multiple areas.</p>		<p>Indicate the relevant categories in the field notes using the following keywords:</p> <ul style="list-style-type: none"> • computing/programming • academic content • navigating software • general computer technology • other

3-6: Other (Please add additional notes)	Use this code when the problem does not have its own code or you are really unsure what the problem is.	Not knowing left from right (unless this is a subject in class),	
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CODE NAME 4

Code Name	Description	Examples (actions/words)	Other Rules
(4) What did the interaction between the Peer or Adult and the student look like?			
<p>4-0: Peer and student discuss the difficulty or problem</p> <p>4-9: Adult and student discuss the difficulty or problem</p>	A back-and-forth discussion of the issue takes place (that isn't a recitation of the solution).	<p>"What have you already tried?"</p> <p>"Tell me what's going on."</p> <p>S: There were three instead of one.</p> <p>A: Okay, where is the program tell how many moons it has.</p>	<p>Timestamp at the same point that the student addresses the peer, because that's when the discussion begins.</p> <p>If classroom management happens in the middle of student/teacher interactions---lump classroom management into the existing interaction we are coding, and use transcripts to quantify student/teacher interaction times.</p>
4-1: Peer and student discuss the difficulty or problem, and another person(s) joins the discussion	When a third person joins the conversation before the problem is solved.	<p>P: I'm not sure why</p> <p>S: "I am not very sure. Do we want to delete the code to try again?"</p> <p>Third person (another peer or adult): "What problem do you have? Do you need help?"</p>	<p>Timestamp when the other person(s) joins the discussion.</p> <p>Code this only when the third person joins problem-solving with back-and-forth conversation.</p> <p>Joining with on problem-solving or with one-off comment on problem-solving does not get coded.</p>

<p>4-2: Peer recites all steps of the solution at once (e.g., Peer does not give the student the chance to talk)</p>	<p>The peer/adult gives the solution without any collaboration.</p>	<p>“Put in a turn block with 90 degrees, and then move forward 20, and then...”</p>	<p>Timestamp when the peer/adult begins reciting steps.</p>
<p>4-3: Peer recites all steps of the solution, and another person(s) joins</p>	<p>The peer gives the solution without any collaboration. During the interaction, another person joins.</p>	<p>P: “Put in a turn block with 90 degrees, and then move forward 20, and then...” 3rd person: “No you have to do 90 and then forward 60.” S/P: “60?”...</p>	<p>Timestamp when the other person(s) joins the discussion. Code this only when the third person joins the discussion with problem-solving comments. Joining with non problem-solving comments does not get coded. The solution does not need to be a correct solution. It's just the solution that is offered.</p>
<p>4-4: Peer physically shows by taking over the student's computer, and no discussions are occurring</p>	<p>Peer does the computing work for the student. There is no problem-solving conversation heard.</p>	<p>Peer does the work for the student. P: Here, Let me do this for you. S: Thanks. What are you doing tomorrow? P: (while working on the student's computer) says, “Nothing much”.</p>	<p>Can't code this unless observation notes indicate the peer took over. Timestamp when the physical takeover happens. There may be conversations taking place, but these are unrelated to the work.</p>
<p>4-5: Peer physically shows by taking over the student's computer, no discussions are occurring, and another person(s) joins</p>	<p>Peer does the computing work for the student. Another person is heard joining the two students as this is taking place.</p>	<p>Dialog clearly indicates it (“Just do it for me” / “Let me show you”/“let me try it”) Field notes can support this as well. As the peer is doing the work for the student, a third student says, “Hey, you shouldn't do that for her. Let her do it.” P1: Ok. What did you try already? S: I was trying to make a triangle. P2: Cool. Did you use the repeat block?</p>	<p>Timestamp when the other person(s) joins the discussion. Code this only when the third person joins the discussion with problem-solving comments. Joining with non problem-solving comments does not get coded.</p>

<p>4-6: Peer physically shows by taking over the student's computer, and discussions are occurring</p>	<p>While peer is doing the computing task for the student, the peer is talking through the steps for problem solving.</p>	<p>Discussion clearly indicates that the peer is providing guided step-by-step directions while doing the work. P: "Let me show you"/"let me try it" P: You need to drag the repeat block over here. P: Now, bring over the walk block. See? Like this. Field notes can support this as well.</p>	<p>Can't code this unless it is clearly heard that the peer is talking about what he or she is doing while doing the work for the student. Observation notes indicate the peer took over. If no audio or observation note confirmation is available, do not code.</p>
<p>4-7: Peer physically shows by taking over the student's computer, discussions are occurring, and another person(s) joins</p>	<p>While peer is doing the computing task for the student, the peer is talking through the steps for problem solving. During the discussion, another person joins the conversation.</p>	<p>Discussion clearly indicates that the peer is providing guided step-by-step directions while doing the work. P: "Let me show you"/"let me try it" P: You need to drag the repeat block over here. P: Now, bring over the walk block. See? Like this. Field notes can support this as well.</p>	<p>Timestamp when the other person(s) joins the discussion. Code this only when the third person joins the discussion with problem-solving comments. Joining with non problem-solving comments does not get coded.</p>
<p>4-8: Peer and student discuss the difficulty or problem, and then Peer directs student to another peer or adult</p>	<p>This interaction begins with a discussion initiated by either the peer or the student. The peer then directs the student to another person for assistance.</p>	<p>P: Clones are pretty advanced. This looks right to me, but you may want to talk to Ms. Tuscadero about that. She is great with cloning.</p>	<p>Use same decision rule as "and another person joins" - use instead of 4-0 if it applies.</p>

<p>4-9: Adult and student discuss the difficulty or problem</p>	<p>A back-and-forth discussion of the issue takes place (that isn't a recitation of the solution).</p>	<p>"What have you already tried?" "Tell me what's going on." S: There were three instead of one. A: Okay, where is the program tell how many moons it has.</p>	<p>See 4-0. Timestamp at the same point that the student addresses the peer, because that's when the discussion begins. If classroom management happens in the middle of student/teacher interactions---lump classroom management into the existing interaction we are coding, and use transcripts to quantify student/teacher interaction times.</p>
<p>4-10: Adult and student discuss the difficulty or problem, and another person(s) joins the discussion</p>	<p>When a third person joins the conversation before the problem is solved.</p>	<p>S: I'm just not sure what to do here to get the backgrounds to change when I want them to.. A: When do you want them to change? What blocks have you tried? P: Have you looked in the purple blocks? Might find something there that would help...just saying!</p>	<p>Timestamp when the other person(s) joins the discussion. Code this only when the third person joins the discussion with problem-solving comments. Joining with non problem-solving comments does not get coded.</p>
<p>4-11: Adult recites all steps of solution at once</p>	<p>The peer/adult gives the solution without any collaboration. (e.g., Adult does not give the student the chance to talk)</p>	<p>S: I can't get this to work.. A: That's because you are asking it to go right and left at the same time. If you really want it to go right and then left, put a wait block between the two.</p>	<p>Use this code if there is no discussion about how to solve the problem or the student's problem solving process. The adult simply provides the solution. Timestamp when the adult begins reciting steps.</p>
<p>4-12: Adult recites all steps of the solution, and another person(s) joins</p>	<p>The adult gives the solution without any collaboration. During the interaction, another person joins.</p>	<p>A: "Put in a turn block with 90 degrees, and then move forward 20, and then..." 3rd person: "No you have to do 90 and then forward 60." S: "60?"...</p>	<p>Timestamp when the other person(s) joins the discussion. Code this only when the third person joins the discussion with problem-solving comments. Joining with non problem-solving comments does not get coded. The solution does not need to be a correct solution. It's just the solution that is offered.</p>

<p>4-13: Adult physically shows by taking over the student's computer, and no discussions are occurring</p>	<p>Here, the adult solves the problem for the student without reciting steps or discussing the solution strategy. There is no problem-solving conversation heard.</p>	<p>A: You are close, but I can see you are getting frustrated. Here, let me show you what is missing. S: Oh, that was it. I thought I was close!</p>	<p>Can't code this unless observation notes indicate the adult took over OR dialog clearly indicates it ("Just do it for me" / "Let me show you") If we do not have verbal confirmation of the takeover, continue without using this code and provide field notes regarding any suspicions of the adult taking over the computer. Timestamp when the physical takeover happens.</p>
<p>4-14: Adult physically shows by taking over the student's computer, no discussions are occurring, and another person(s) joins</p>	<p>Adult does the computing work for the student. Another person is heard joining the two student and adult as this is taking place.</p>	<p>Dialog clearly indicates it ("Just do it for me" / "Let me show you"/"let me try it" Field notes can support this as well. As the peer is doing the work for the student, a third person joins the interaction. A: Here, let me show you how to do that. S: I was trying to make a triangle. A: Just watch. P: Cool. Did you use the repeat block?</p>	<p>Timestamp when the other person(s) joins the discussion. Code this only when the third person joins the discussion with problem-solving comments.</p>
<p>4-15: Adult physically shows by taking over the student's computer, and discussions are occurring</p>	<p>The adult takes over the students computer, but does so while offering an explanation or providing support through discussion.</p>	<p>S: I've been on this level for days! A: I see what the problem is. Let me show you. See this right here? What number do you have inside your loop? S: 3 A: Right, but watch what happens when I change it to a 4... S: It works!</p>	<p>Can't code this unless observation notes indicate the adult took over OR dialog clearly indicates it. Timestamp the takeover. If we do not have verbal confirmation of the takeover, continue without using this code and provide field notes regarding any suspicions of the adult taking over the computer</p>

<p>4-16: Adult physically shows by taking over the student's computer, discussions are occurring, and another person (s) joins</p>	<p>The adult takes over the students computer, but does so while offering an explanation or providing support through discussion. During the discussion, a peer or another adult joins.</p>	<p>Discussion clearly indicates that the adult is providing guided step-by-step directions while doing the work. A: "Let me show you"/"let me try it" A: You need to drag the repeat block over here. A: Now, bring over the walk block. See? Like this. Field notes can support this as well.</p>	<p>Timestamp when the other person(s) joins the discussion. Code this only when the third person joins the discussion with problem-solving comments. Joining with non problem-solving comments does not get coded.</p>
<p>4-17: Adult and student discuss the difficulty or problem, and then Adult directs student to another peer or adult</p>	<p>This interaction begins with a discussion initiated by either the adult or the student. The adult then directs the student to another person for assistance.</p>	<p>S: I'm wondering why that sprite isn't cloning like I want it to... A: Clones are pretty advanced. This looks right to me, but you may want to talk to Ms. Tuscadero about that. She is great with cloning.</p>	<p>Timestamp when the adult directs the student to a peer or another adult.</p>
<p>4-18: Peer directs student to talk to another peer or adult</p>	<p>Peer directs the student to someone else. Peer may or may not state that they can't/won't help the student.</p>	<p>"I don't know how. Go ask the teacher." "I'm still working on my project. I don't really want to stop. myFolder is way ahead. Can you ask her?"</p>	<p>Code only if peer/adult redirects without any discussion of problem. If a discussion happens before redirection, code 4-0 or similar.</p>
<p>4-19: Peer clearly states that he or she does not know how to help</p>		<p>"I have no idea." "I don't know..."</p>	<p>Only code this if there is no redirecting happening.</p>
<p>4-20: Peer clearly states that he or she does not want to help</p>		<p>"I am not allowed to." "I'm busy now. Sorry."</p>	<p>Only code this if there is no redirecting happening.</p>

<p>4-21: Adult directs student to talk to another peer or adult</p>	<p>Adult directs the student to someone else. Adult may or may not state that they can't/won't help the student.</p>	<p>S: I'm so frustrated! A: Did you ask a friend to help yet? S: Not yet. A: Go ask Javonn for help. He finished a bit earlier.</p>	<p>This interaction DOES NOT begin with a discussion initiated by either the adult or the student. The adult simply directs the student to another person for assistance.</p>
<p>4-22: Adult clearly states that he or she does not know how to help</p>	<p>Adult states that they don't know how to help the student.</p>	<p>S: Can you help me with this Mr. Gibson. A: Listen kid, I don't know how to do that and I'm reading my paper.</p>	<p>Only code this if there is no redirecting happening.</p>
<p>4-23: Adult is unwilling to help</p>		<p>S: I am so stuck! Mr. Greenjeans, can you help me? A: Sorry kid, Bask in your frustration! I help you enough. S: You are SO MEAN all the time.</p>	<p>Only code this if there is no redirecting happening. Note that the adult here verbally states that they do not want to help or are unwilling. They may or may not know how to help, but that it not vocalized here.</p>
<p>4-24: Adult verbally comments on student's work</p>			
<p>4-25: Student dismisses his or her attempt for interacting (e.g. student does not call the person again) [end path]</p>	<p>The student verbally dismisses an interaction that is either ongoing or was just started by the student.</p>	<p>S: Hey, I don't know what's going on here. P: Hmmmm,. Let me look at my code. S: Actually, forget. I think I got it.</p>	<p>There is evidence of an attempted problem-solving interaction by the student. The student then verbally states that they are done with the interaction. If problem-solving is involved before the dismissal, code the problem solving before coding 4-25.</p>
<p>4-26: Peer dismisses his or her attempt for interacting (e.g. peer does not call the student again) [end path]</p>	<p>The peer verbally dismisses an interaction attempt that is either ongoing or just started by the peer.</p>	<p>P: Hey, I don't know what's going on here. S: Hmmmm,. Let me look at my code. P: Actually, forget. I think I got it.</p>	<p>There is evidence of an attempted problem-solving interaction by the peer. The student then verbally states that they are done with the interaction. If problem-solving is involved before the dismissal, code the problem solving before coding 4-26.</p>

<p>4-27: Adult dismisses his or her attempt for interacting (e.g. adult does not call the student again) [end path]</p>	<p>The adult verbally dismisses an interaction attempt from the student.</p>		
<p>4-28: Student ignored or cannot hear or code student's response to peer</p>	<p>The student ignores the question/response. Or the audio of the response is not clear enough to hear and code.</p>		<p>Use if you hear a response but cannot code it (unintelligible) or if there is evidence that the student is ignoring the peer. We likely cannot tell the difference between ignored or can't hear unless we have observation notes to tell us that the student ignored the peer.</p>
<p>4-29: Student ignored or cannot hear or code student's response to adult</p>	<p>The student ignores the questions/response. Or the audio of the response is not clear enough to hear and code.</p>		<p>Use if you hear a response but cannot code it (unintelligible) or if there is evidence that the student is ignoring the adult from field notes.</p>
<p>4-30: Peer ignored or cannot hear or code peer's response to student</p>	<p>The peer ignores the questions/response. Or the audio of the response is not clear enough to hear and code.</p>		<p>Use if you hear a response but cannot code it (unintelligible) or if there is evidence that the peer is ignoring the student.</p>
<p>4-31: Adult ignored or cannot hear or code adult's response to student</p>	<p>The adult ignores the question/response. Or the audio of the response is not clear enough to hear and code.</p>		<p>Use if you hear a response but cannot code it (unintelligible) or if there is evidence that the adult is ignoring the student.</p>
<p>4-32: Can't code interaction [end path]</p>			

<p>4-33: Student and peer discuss a difficulty or problem</p>	<p>A back-and-forth discussion of the issue takes place (that isn't a recitation of the solution)</p>	<p>"What have you already tried?" "Tell me what's going on." S: there were three instead of one. P: okay, where is the program tell how many moons it has.</p>	<p>Timestamp at the same point that the student addresses the peer, because that's when the discussion begins. If classroom management happens in the middle of student/teacher interactions---lump classroom management into the existing interaction we are coding, and use transcripts to quantify student/teacher interaction times.</p>
<p>4-34: Student and peer discuss a difficulty or problem, and another person(s) joins the discussion</p>	<p>When a third person joins the conversation before the problem is solved.</p>	<p>S: I'm not sure why P: " I am not very sure. Do we want to delete the code to try again?" Third person (another peer or adult): "what problem do you have? Do you need help?"</p>	<p>Timestamp when the other person(s) joins the discussion. Code this only when the third person joins problem-solving with back-and-forth conversation. Joining with on problem-solving or with one-off comment on problem-solving does not get coded.</p>
<p>4-35: Student recites all steps of the solution</p>	<p>The student gives the solution without any collaboration. (e.g., Student does not give the student the chance to talk)</p>	<p>"Put in a turn block with 90 degrees, and then move forward 20, and then..."</p>	<p>Timestamp when the student begins reciting steps</p>
<p>4-36: Student recites all steps of the solution, and another person(s) joins</p>	<p>The student gives the solution without any collaboration. Another person joins the interaction during the recitation. (e.g., Student does not give the student the chance to talk)</p>	<p>P: I can't get this to work... S: That's because you are asking it to go right and left at the same time. If you really want it to go right and then left, put a wait block between the two.</p>	<p>Use this code if there is no discussion about how to solve the problem or the student's problem solving process. The adult simply provides the solution.</p>

<p>4-37: Student physically shows by taking over the peer's computer, and no discussions are occurring</p>	<p>Here, the student solves the problem for the student without reciting steps or discussing the solution strategy. Peer does the computing work for the student. There is no problem-solving conversation heard.</p>	<p>Student does the work for the peer.. S: Here, Let me do this for you. P: Thanks. What are you doing tomorrow? S: (while working on the peer's computer) says, "Nothing much"</p>	<p>If no direct audio evidence exists, refer to field notes on whether student actually takes over peer's computer. Can't code this unless observation notes indicate the peer took over. Timestamp when the physical takeover happens. There may be conversations taking place, but these are unrelated to the work.</p>
<p>4-38: Student physically shows by taking over the peer's computer, no discussions are occurring, and another person(s) joins</p>	<p>Student does the computing work for the peer. Another person is heard joining the two students as this is taking place.</p>	<p>Dialog clearly indicates it ("Just do it for me" / "Let me show you"/"let me try it" Field notes can support this as well. As the student is doing the work for the peer, a third person joins the interaction. A: Here, let me show you how to do that. S: I was trying to make a triangle. A: Just watch. P: Cool. Did you use the repeat block?</p>	<p>If no direct audio evidence exists, refer to field notes on whether student actually takes over peer's computer.</p>
<p>4-39: Student physically shows by taking over the peer's computer, and discussions are occurring</p>	<p>The student takes over the peer's computer, but does so while offering an explanation or providing support through discussion.</p>	<p>S: Here, let me show you how I did it. P: Sure, be my guest. S: See where I am getting this block from?</p>	<p>If no direct audio evidence exists refer to field notes on whether student actually takes over peer's computer.</p>

<p>4-40: Student physically shows by taking over the peer's computer, discussions are occurring, and another person (s) joins</p>	<p>While the student is doing the computing task for the peer, the student is talking through the steps for problem solving. During the discussion, another person joins the conversation.</p>	<p>S: Here, let me show you how I did it. P: Sure, be my guest. S: See where I am getting this block from? P2: Yep, you can use that , but there is another way to do it as well. S and P(in unison): For reals???</p>	<p>If no direct audio evidence exists refer to field notes on whether student actually takes over peer's computer. Timestamp when the other person(s) joins the discussion. Code this only when the third person joins the discussion with problem-solving comments. Joining with non problem-solving comments does not get coded.</p>
<p>4-41: Student and peer discuss a difficulty or problem, and then student directs peer to another peer or adult</p>	<p>This interaction begins with a discussion initiated by either the peer or the student. The student then directs the peer to another person for assistance.</p>	<p>S: I'm wondering why that sprite isn't cloning like I want it to... P: Clones are pretty advanced. S: This looks right to me, but you may want to talk to Ms. Tuscadero about that. She is great with cloning.</p>	<p>Timestamp when the adult directs the student to a peer or another adult.</p>
<p>4-42: Student directs peer to talk to another peer or adult</p>	<p>This interaction DOES NOT begin with a discussion initiated by either the student or the peer. The student simply directs the peer to another person for assistance.</p>	<p>P: "I can't make it move..." S: "Go ask Mrs. Murrey."</p>	<p>This interaction is not a continuation of discussion between peer and student.</p>
<p>4-43: Student clearly states that he or she does not know how to help</p>		<p>"I have no idea how to solve this problem." "It confused me too..."</p>	<p>Only code this if there is no redirecting happening.</p>
<p>4-44: Student clearly states that he or she does not want to help</p>		<p>"Sorry, I have to work on my task now." "You're supposed to figure it out by yourself."</p>	<p>Only code this if there is no redirecting happening.</p>

<p>4-45: Student's cursor stopped moving for more than 30 seconds, or the student leaves station (> 30 seconds) and returns to independently work [end path]</p>			<p>Timestamp this code at the point where the student leaves the station or the student's cursor stops moving. Begin the next path at the point where the student returns to their station or the cursor begins moving.</p>
<p>4-46: Interaction terminates [end path]</p>			

CODE NAME 5

Code Name	Description	Example (actions/words)	Other Rules
<p>(5) Was the problem solved or not solved? (Was the difficulty solved?)</p> <p>A problem=a challenge that the student is facing. Specific question that the participant proposes or a problem during a computing task. Not the general computing task/lesson.</p>			
<p>5-0: Problem was not solved</p>	<p>The problem or difficulty that the student faced was not solved.</p>	<p>Scratch: Student works independently on one problem/difficulty (making the sprite move) and then shifts to another task (working on the background).</p>	<p>Pick this choice when, at the end of an interaction or independent work (which may involve several attempts of problem-solving), the problem is not solved.</p> <p>Code if:</p> <ul style="list-style-type: none"> • Interaction or independent work ends without the problem being solved. • Interaction changes to socialization/non-problem-solving without problem being solved. • Another party joins without the problem being solved. • Video ended but the problem remained unsolved. • Student stopped working on the problem. <p>Timestamp the same time as the code immediately preceding.</p> <p>Swapping from (problem-solving) interaction to independent work:</p> <p>When we see 10 seconds of independent work without interaction, then we go back to the end of the interaction and (same timestamp for each):</p> <ul style="list-style-type: none"> • Code “problem not solved”, then interaction termination, then immediately start coding independent work.

<p>5-1: Problem was solved</p>	<p>The problem/difficulty the student faced was perceived to be solved by the student. This may not necessarily mean that the problem was solved correctly, more efficiently, or optimally. It is about the student's perception of "problem solved" Use field notes to describe the problem solving solution in detail.</p>	<p>Possible evidence: The conversation indicates that the problem was solved (e.g., student successfully located the shrink button, saying "Oh! Thank you!") Evidence on the screen. (e.g., Code.org success feedback; the code successfully worked as expected).</p>	<p>Pick this choice when, at the end of an interaction or independent work (which may involve several attempts of problem-solving). Code as soon as there is evidence to show that the problem is perceived solved (success screen on code.org, etc). If it is a programming challenge, a piece of evidence could be the student successfully running the program. The problem does not need to be solved correctly -- the student only needs to believe the problem was solved correctly, even if s/he is incorrect. (e.g. confuses left/right, counts incorrectly, etc.) If the student believes that the problem is solved and there is no functional difference in their technically incorrect solution (student asked for spelling help and ended up spelling something wrong), code as problem solved.</p>
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CODE NAME 6

Code Name	Description	Examples (actions/words)	Other Rules
(6) What is the nature of the student's computing-related communication with the peer or adult?			
<p>6-0: Student questions peer about something associated with peer's work</p>	<p>Student asked questions about peer's work. This is not part of a problem-solving discussion.</p>	<p>"Wow...that's cool. How did you make it?" "How many sprites you have in your program?" "Which block did you choose?" Evidence on screen: e.g., student may or may not stop working, and we hear that the student is asking some questions.</p>	<p>Code this when</p> <ul style="list-style-type: none"> • student asked any kind of questions related to peer's work • without a request for help, even if it may lead to a problem-solving conversation. <p>One-off rule applies. There has to be evidence of an interaction.</p>

<p>6-1: Student verbally comments about his/her own work, e.g. accomplishment</p>	<p>Student commented on his/her own work, showing excitement/accomplishment to the peer or adult about his/her own work.</p>	<p>S: "It is cool right?" P: Yeah, cool. S: "Look what I did! I made a fun story!" P: How'd you do that? S: Comments on what they did.</p>	<p>Code this when</p> <ul style="list-style-type: none"> • student comment (show how he/she feels or what he/she did on his/her work). • there is no clear request for problem-solving, even if it may lead to a problem-solving conversation. <p>Evidence of back-and-forth must be present. One-off rule applies.</p>
<p>6-2: Student verbally comments about something associated with peer's work</p>	<p>Student made comments on peer's work without the intention for help-seeking or discussion.</p>	<p>S: "That's nice." P: "Oh it's a cool animation!" S: "I like your background." "You can add another sprite..."</p>	<p>Code this when student generally talks about how he/she feels about the peer's work, or the suggestions he/she have regarding peer's work which may lead to a help-seeking path.</p> <p>Evidence of back-and-forth must be present. One-off rule applies.</p>
<p>6-3: Student expresses dissatisfaction or frustration</p>	<p>The student verbally expresses their frustration or dissatisfaction with their work.</p>	<p>E.g.1 S:"This sucks!" Peer: "What?" e.g.2 S:"This is boring." P: "Sorry man. Life sucks sometimes."</p>	<p>Code this when a student expresses frustration without a specific, verbal request for help, even if the frustration leads to a problem-solving response from peer/adult. This may be self-talk.</p> <p>One-off rule DOES NOT apply. Code this even it is an one-off (see example).</p>
<p>6-4: Student said something that is unclear or inaudible</p>	<p>Choose this code when the recording did not capture what student was saying; or if the audio is unclear.</p>	<p>S: Heyyyyyy! Okay, okay, so, I know I went there, now I got to go (inaudible). (Inaudible self-talk). Noise</p>	<p>Choose this code when the recording did not capture what student was saying; or if the audio is unclear.</p>

<p>6-5: Peer questions student about something associated with student's work</p>	<p>Peer asked questions about student's work. This is not part of a problem-solving discussion.</p>	<p>Examples: "Where did you find this sprite?" "Which level are you working on?" "How did you make it move like that?" "How did you draw that sprite?"</p> <p>Non- examples: What are you doing this weekend? Is our science test today?</p>	<p>Code this when</p> <ul style="list-style-type: none"> • student asked any kind of questions related to peer's work. • without a request for help, even if it may lead to a problem-solving conversation. <p>One-off rule applies. There has to be evidence of an interaction.</p>
<p>6-6: Peer verbally comments about something associated with his/her own work, e.g. accomplishment</p>	<p>Peer commented on his/her own work, showing excitement/ accomplishment to the student or adult about his/her own work.</p>	<p>P: "It is cool right?" S: Yeah, cool. P: "Look what I did! I made a fun story!" S: How'd you do that? P: Comments on what they did.</p>	<p>Code this when</p> <ul style="list-style-type: none"> • peer comment (show how he/she feels or what he/she did on his/her work); • there is no clear request for problem-solving, even if it may lead to a problem-solving conversation. <p>Evidence of back-and-forth must be present. One-off rule applies.</p>
<p>6-7: Peer verbally comments about something associated with student's work</p>	<p>Peer made comments on student's work without the intention for help-seeking or discussion.</p>	<p>Examples: P: "That's nice." S: "Oh it's a cool animation!" P: "I like your background." "You can add another sprite..."</p> <p>Non-Example: "How did you do that?"</p>	<p>Code this when the peer generally talks about how he/she feels about the student's work, or the suggestions he/she have regarding peer's work which may lead to a help-seeking path.</p> <p>Evidence of back-and-forth must be present. One-off rule applies.</p>

<p>6-8: Peer expresses dissatisfaction or frustration</p>	<p>Frustration-expressing path. Any verbalization that indicates the peer is distressed, confused, etc. about the computing ask (does not need to be programming).</p> <p>The peer verbally expresses their frustration or dissatisfaction with their work.</p>	<p>E.g.1 P: "This sucks!" S: "What?" P: I hate coding S: Why? I love making this rocket ship. Look.... e.g.2 P: "This is boring" S: "Sorry man. Life sucks sometimes." P: You are not being a very sympathetic friend S: Ok. I'll do better.</p>	<p>Code this when a peer expresses frustration without a specific, verbal request for help, even if the frustration leads to a problem-solving response from peer/adult. This may be self-talk.</p> <p>One-off rule applies.</p>
<p>6-9: Peer said something that is unclear or inaudible</p>	<p>Choose this code when the recording did not capture what the peer was saying; or if the audio is unclear.</p>	<p>S: Heyyyyyy! Okay, okay, so , I know I went there, now I got to go (inaudible). Now I've got to move forward. Move forward (adds another block), now how am I going to get down? (Inaudible self-talk).</p> <p>Noise</p>	<p>Choose this code when the recording did not capture what student was saying; or if the audio is unclear.</p>

CODE NAME 7

Code Name	Description	Examples (actions/words)	Other Rules
(7) What is the peer/adult's response to the student's computing-related communication?			
7-0: Peer verbally responds to the student's comment about work (eg,	The peer responds to something the student said about the student's computing work (e.g. curiosity, excitement and frustration about the project, the peer responded).	S: "Don't you think it's awesome?" "I know, that's cool." S: "It's so hard for me to focus on my code." P: "Me too/I agree."	The discussion is not related to the process of problem solving. If this interaction leads into problem solving, switch to problem solving path. If already in a problem solving path and a peer expresses curiosity, excitement or frustration, note that in field notes and continue to code in the problem solving path.
7-1: Adult verbally responds to the student's curiosity, excitement, or frustration	When the student engaged in the interaction with adult and express curiosity, excitement and frustration about the project, AND the adult responded.	S: "What's this character, a creep dog?" A: "Yes, It's not creep. It's just a kind of dog." S: "I don't want to do this. I am exhausted now." A: "You can have one minute break and try it again. Or you can try another project."	The curiosity, excitement and frustration is not related to the process of problem solving. If this leads into problem solving, switch to problem solving path. If already in a problem solving path and a peer expresses curiosity, excitement or frustration, note that in field notes and continue to code in the problem solving path.
7-2: Interaction terminates [end path]			

<p>7-3: Student/peer/adult ignored or cannot hear or code the response</p>	<p>The student/peer/adult ignores the questions. Or the audio of the response is not clear enough to hear and code.</p>	<p>S: "How can I code this?" Others:</p>	<p>When using this code, make sure there is no response and inaudible. Ignore : 10 seconds Inaudible: No need for 10 seconds If the peer/adult responds, but it's after 10 seconds, that's ok. Just put it in field notes.</p>
<p>7-4: Student/peer/adult said something that is unclear or inaudible</p>	<p>You cannot hear what the student/peer/adult said clearly</p>	<p>Recording cannot be heard.</p>	<p>The audio is unclear to code.</p>
<p>7-5: Student verbally responds to the peer's curiosity, excitement, or frustration</p>	<p>When the student engages in the interaction with peer and the peer expresses curiosity, excitement and frustration about the project, AND the student responds.</p>	<p>P: "Which character are you coding?" S: "The cat. See? I'm making her into a zombie cat." P: Cool. I like her red eyes. S: Yeah.</p>	<p>The curiosity, excitement and frustration is not related to the process of problem solving. If this leads into problem solving, switch to problem solving path. If already in a problem solving path and a peer expresses curiosity, excitement or frustration, note that in field notes and continue to code in the problem solving path.</p>
<p>7-6: Student offers support to peer (the peer did not specifically ask for help)</p>	<p>The student provides help for peers while the peer is working on his/her project.</p>	<p>Example 1: P: working independently and occasionally sighing. "Hhhhhhh" S: "Can I help you to solve the problem?" P: That would be amazing. Thanks. Example 2: P: Works independently. Sighs. "Hhhhhhh" S: Do you want help? P: Not heard on computer, ignored, or says no</p>	<p>The peer does not ask the student for the help. Student provides help voluntarily. One-off rule does not apply (example 1).</p>

CODE NAME 9

Code Name	Description	Examples (actions/words)	Other Rules
(9) How did the student/peer respond to the non-computing conversation?			
9-0 Peer verbally responds to student's non-computing conversation	Peer and student in the conversation. And peer response to the student. The conversation is not related to computing.	S: "When will the class be over? P: "10 am" S: Cool. I can't wait for recess! P: Yeah, let's go to the monkey bars!	The conversation is NOT related to the process of problem solving or computing. If this interaction leads into problem solving, switch to problem solving path. If already in a problem solving path and a peer expresses curiosity, excitement or frustration, note that in field notes and continue to code in the problem solving path. One-off rule applies here.
9-1 Adult verbally responds to student's non-computing conversation	Adult and student in the conversation. Adult responds to the student. The conversation is not related to the computing.	S: When is recess? A: In 10 minutes S: Why can't it be NOW!!!! A: Time doesn't work that way. S: Ok.	The conversation is NOT related to the process of problem solving or computing. If this interaction leads into problem solving, switch to problem solving path. If already in a problem solving path and a peer expresses curiosity, excitement or frustration, note that in field notes and continue to code in the problem solving path. One-off rule applies here.
9-2 Interaction terminates [end path]		https://www.youtube.com/watch?v=VScSEXrWUqQ	
9-3 Student/peer/adult ignored or cannot hear or code response	The student/peer/adult ignores the questions. Or the audio of the response is not clear enough to hear and code.	Ignore: S: How many minutes left for this class? P/A ignores the question and does not response.	When using this code, make sure there is no response and inaudible. Ignore : 10 seconds Inaudible: No need for 10 seconds If the peer/adult responds, but it's after 10 seconds, that's ok. Just put it in field notes.

<p>9-4: Peer or adult redirects student to the computing task</p>	<p>Peer or adult interacts with student and tells the student to get back to the computing project.</p>	<p>P: "Let's get back to the Scratch activity. How about we try the 'when' block."</p>	<p>One-off rule does not apply here.</p>
<p>9-5: Student/peer/adult said something that is unclear or inaudible</p>	<p>You cannot hear what the student/peer/adult said clearly.</p>	<p>Recording cannot be heard.</p>	
<p>9-6: Student verbally responds to peer's non-computing conversation</p>	<p>Student responds and engages in the non-computing conversation.</p>	<p>P: "I am going to Disney this weekend." S: "That's awesome. Which park will you go to?" P: I think Animal Kingdom.</p>	<p>The conversation is NOT related to the process of problem solving or computing. If this interaction leads into problem solving, switch to problem solving path. If already in a problem solving path and a peer expresses curiosity, excitement or frustration, note that in field notes and continue to code in the problem solving path. One-off rule applies.</p>
<p>9-7: Student redirects peer to the computing task</p>	<p>Student interacts with peer and leads peer(s) back to the computing project.</p>	<p>P: "Will you adopt a cute cat?" S: " Can you continue your coding?"</p>	<p>One-off rule does apply here. If the peer is a participant. Take close field notes that can then be used to help code the peer's video including timestamps.</p>

CODE NAME 12

Code Name	Description	Examples (actions/words)	Other Rules
(12) How does the event end or continue? (Independent Path)			
12-0: Student's cursor stopped moving for more than 30 seconds, or the student leaves station (> 30 seconds) and returns to independently work [end path]			Timestamp this code at the point where the student leaves the station or the student's cursor stops moving. Begin the next path at the point where the student returns to their station or the cursor begins moving.
12-1: The video record ends [end path]			
12-2: Student solves a problem previously discussed during an interaction [end path]	Student goes back to a problem that they previously did not solve and works on this problem. This problem may or may not get solved during this independent work time.	<p>Example:</p> <p>Student works collaboratively on Problem #2 and says, "Hold up. I can do this to my Cow sprite!"</p> <p>Interaction terminates. Student goes to the Cow Sprite and fixes the code independently.</p>	<p>How to code this scenario:</p> <p>Only way to get to Node 12 is through Node 0. In these cases, go to "Other" and use field notes to describe. "Other" will take you to Node 0 and then go to subcode choices 0-4 or 0-5.</p> <p>Make sure that you label the path with the corresponding problem (e.g., problem 1 vs problem 2).</p> <p>The 30-second independent work rule MAY OR MAY NOT apply here. (eg. students work collaboratively on something, they switch to the independent work).</p>

<p>12-3: Interaction begins [end path]</p>			<p>Timestamp this code when the interaction begins. Create a new path for the interaction and start it at the same timestamp.</p>
<p>12-4: Student switches to a computing related task while working independently [self loop]</p>	<p>Initially, the student is doing non-computing independent work. The student then switches to independently working on the computing task.</p>	<p>Example: Student was playing Minecraft and then switched to Scratch.</p> <p>Non-example: Student was playing the finished Scratch project and switched to Scratch programming. (put in the field notes that student is running previous code).</p>	<p>Switch from 0-5 to 12-4:</p> <p>Initially, the student is doing non-computing independent work. The student then switches to independently working on the computing task.</p>
<p>12-5: Student switches to a non-computing task while working independently [self loop]</p>	<p>Initially, the student is doing computing independent work. The student then switches to non-computing independent activity</p>	<p>Example: Student was working in Scratch and then switched to Minecraft.</p> <p>Non-example: Student was working on a Code.org puzzle and then switched to a previously completed Code.org puzzle to play that puzzle. (Put in field notes that the student is rerunning previous code).</p>	<p>Switch from 0-4 to 12-5:</p> <p>Initially, the student is doing computing independent work. The student then switches to non-computing independent activity</p> <p>Only use this code when the student switches to something completely unrelated to the computing task such as a YouTube video, other video game, drawing something on paper evident from field notes, etc.</p>

BROAD DECISION RULES:

Problem Path (how to decide what is a discrete problem)

- Most discrete problems are made up of subproblems.
- When deciding what is a problem for the purposes of a path, use both student dialogue and work to decide on what broad task they are trying to complete.
- Any steps they take to solve the broader problem are considered subproblems.
- Can the (sub)problem exist without the context of a broader problem?
- Go back to the problem description to indicate all of the problem types/categories encountered while solving the broader problem.
- Use field notes. Use exact language in problem choices if possible (e.g. academic content, computing/programming, navigating software).

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