OECD Programme for International Student Assessment 2015

PISA 2015 RELEASED FIELD TRIAL COGNITIVE ITEMS - CPS

Doc: CY6_TST_PISA2015FT_Released_Cognitive_Items

Produced by ETS (Core 3 Contractor)

OECD
BETTER POLICIES FOR BETTER LIVES

PISA 2015 Contractors

ETS   Westat   PEARSON   DIPF
Educational Research
and Educational Information

Σημείωση:

Το αποδεσμευμένο υλικό για τη Συνεργατική Επίλυση Προβλήματος έχει δοθεί από τους διοργανωτές υπό την μορφή screen shots και δεν είναι διαδραστικό. Ως εκ τούτου το σχετικό υλικό έχει αναρτηθεί στην ιστοσελίδα του ΚΕΕΑ αυτούσιο, όπως έχει δοθεί από τους διοργανωτές, και αποτελεί μία ένδειξη της μορφής των ασκήσεων που περιλαμβάνονται στην εξέταση PISA 2015 για τη Συνεργατική Επίλυση Προβλήματος.

Contents

Collaborative Problem Solving – Overview

One Collaborative Problem Solving unit from the 2015 Field Trial was approved for release by the Collaborative Problem Solving Expert Group. This unit, The Visit, included 44 measurable student actions (or "items") and was completed by students during the Field Trial in a mean time of about 17 minutes. A total of six units were developed for the Field Trial and five were moved forward for inclusion in the 2015 Main Study.

As the innovative domain for PISA 2015, Collaborative Problem Solving (CPS) is defined in the draft framework as "the capacity of an individual to effectively engage in a process whereby two or more agents attempt to solve a problem by sharing the understanding and effort required to come to a solution and pooling their knowledge, skills and efforts to reach that solution." The framework identifies three core collaborative competences:

- Establishing and maintaining a shared understanding
- Taking appropriate action to solve the problem
- Establishing and maintaining team organisation

Additionally, the CPS construct includes core problem solving competencies including:

- Exploring and understanding
- Representing and formulating
- Planning and executing
- Monitoring and reflecting.

Taken together, these form a matrix of CPS competencies, as shown in the figure below. Across the CPS units, items were developed to fit all cells in that matrix.

	(1) Establishing and maintaining shared understanding	**(2) Taking appropriate action to solve the problem**	**(3) Establishing and maintaining team organisation**
(A) Exploring and Understanding	(A1) Discovering perspectives and abilities of team members	(A2) Discovering the type of collaborative interaction required and establishing goals	(A3) Understanding roles to solve problem
(B) Representing and Formulating	(B1) Building a shared representation and negotiating the meaning of the problem (common ground)	(B2) Identifying and describing tasks to be completed	(B3) Describing roles and team organisation (communication protocol/rules of engagement)
(C) Planning and Executing	(C1) Communicating with team members about the actions performed	(C2) Enacting plans	(C3) Following rules of engagement
(D) Monitoring and Reflecting	(D1) Monitoring and repairing the shared understanding	(D2) Monitoring results of actions and evaluating success in solving the problem	(D3) Monitoring, providing feedback and adapting the team organisation and roles

The CPS units include chat-based tasks where students interact with one or more agents, or simulated team members, to solve a presented problem. Students are presented with a set of chat options and are asked to select the most appropriate choice. Once selected, the choice displays in the chat history area, and then responses from one or more agents follow. Students can scroll through the history to review chat as needed. Responses from agents are based on student selections. As a result, there are multiple paths through each unit. To ensure that any incorrect or non-optimal selections will not penalise students as they progress through the task, each unit is designed with convergence, or rescue, points. At these points, one of the agents provides necessary information or helps advance the collaborative problem solving process so that students can continue to progress through the task.

In addition to the chat interactions, the CPS units include a task area on the right side of the screen where students can take actions, view notes recorded by agents, or keep track of progress through the task. In the sample screen from part 1 of The Visit shown below, the task area includes clickable links to three websites with information that is needed to solve the problem that has been assigned to the team as well as a notepad where key information is recorded by teammates.

Chat Space   Task Space

Format for this Released Unit

Because there are multiple paths through CPS units it is not possible to provide screen shots for each screen in the unit in a clearly understandable way. The screen shots provided show the optimal path through each part of the unit. Descriptions are provided for all alternate paths and their associated items.

For each item, the following information is provided:

Item Number	
Credited Response	
Classification	

Item Number: Each number includes the designation used for CPS (CC), the unit number (101), the part designation (1, 2 or 3) followed by a two-digit item ID.

Credited response: Each credited response, or responses, is listed. For each chat-based item, the correct response can also be indentified in the screen shot by the blue highlighting that displays on screen when students select an option. Where more than one response is credited, that is noted in the descriptive text.

Classification: The framework classification for each item is also listed. A letter/number combination references the CPS competencies matrix, as shown on page 47.

The Visit
Unit Overview

The premise for this unit is that a group of international students is coming to visit a school. The student must collaborate with 3 agent teammates and a faculty advisor to plan the visit, assign visitors to guides, and respond to an unexpected problem that arises.

Part 1: Overview

In Part 1of The Visit, the student and three teammates collaborate to identify an appropriate trip to a local point of interest for the visitors. In order to make their recommendation, the team needs to share and discuss their preferences, repair a misunderstanding about when one of the sites is open, and make a final selection.

Challenges requiring collaborative skills include the need for the student to:
- solicit and take into account criteria for assessing the outing options
- clarify statements made by other teammates
- correct misinformation and avoid an impasse
- prompt team members to perform their tasks
- ensure that the final recommendation meets all specified criteria

Part 1 Introduction

The opening screen provides an overview for students. The goal for Part 1 is defined and students learn that there are three potential sites to be considered for the trip.

Part 1 Directions

Directions for the task are presented on the left side of the screen, as shown below. The task pane on the right includes a notepad, where key points from the chat will display, and links to the three local sites under consideration. Clicking on a link displays a brief list of relevant information for each site (location, hours of operation, tour information, and what visitors can see there).

Part 1 – Sample Screen #1

Item	CC101101
Credited Response	Let's discuss what's necessary for a good visit.
Classification	(B2) Identifying and describing tasks to be completed

The student must select from among four chat choices to respond to George's open-ended question about where to begin. The first and third options are not credited because they are both attempts to avoid taking action. While the second option ("We've got three choices. Let's put it to a vote") might sound collaborative, it does not really help the team solve the presented problem as they do not yet have enough information to select a site. Therefore this option is not credited as correct.

If the student does <u>not</u> select the credited response, Rachel rescues by saying "We need to make a decision soon. Let's talk about what a visit site should be like."

Part 1 – Sample Screen #2

Brad mentions that the group is supposed to visit someplace local.

Item	CC101102
Credited Response	If it's local it could show what life is like around here.
Classification	(B1) Building a shared representation and negotiating the meaning of the problem (common ground)

The second response is credited because it is the only one of the four that helps advance the group's shared understanding of what "local" might mean.

If the student does not select the credited response, George rescues by saying, "So maybe it should give a sense of what our town is like."

Part 1 – Sample Screen #3

Rachel adds a note to the notepad confirming that the site should "provide sense of life in our town."
Brad comments that, "Local means that the site is not far away."

Item	CC101103
Credited Response	So it shouldn't take too long to get there and back.
Classification	(C1) Communicating with team members about the actions performed

The credited response helps advance the shared understanding by clarifying one criterion the selected site must meet.

Part 1 – Sample Screen #4

Regardless of the student response for the previous item, Rachel makes an entry on the notepad and answers by saying, "OK, 'local' means you can get there quickly. I'll put 'travel time' on the Notepad. Anything else?"
George responds by bringing up the schedule that must be met. "Ms. Cosmo said that the bus will pick us up at 1:00 PM next Thursday and bring us back by 3:00."

Item	CC101104
Credited Response	Are all the sites open then?
Classification	(C3) Following rules of engagement, (e.g., prompting other team members to perform their tasks)

In this case, the credited response helps move the problem solving process forward, pointing out to the team that they need to be sure the selected site meets the schedule defined by Ms. Cosmo.

Part 1 – Sample Screen #5

Any selection made by the student is followed by a comment from Brad. He goes off task a bit, saying, "Who cares? All of these choices are boring. Let's take our visitors someplace they'll actually enjoy."

Item	CC101105
Credited Response	Brad, you're right that we want them to enjoy themselves, but we should discuss Ms. Cosmo's options first.
Classification	(D1) Monitoring, providing feedback and adapting the team organisation and roles

The credited response acknowledges Brad's statement while reminding him about the team's task, providing feedback to keep the discussion focused.

Part 1 – Sample Screen #6

Each team member expresses an opinion about the site selection. George states that any site is probably ok, Rachel suggests the museum of local history, and Brad says the museum is boring and that he thinks it is closed.

Item	CC101106
Credited Response	The student must click on the museum website, as shown above, in order to receive either full or partial credit. Full credit response: Rachel , the museum is open only on weekends. Let's look at the other options Partial credit response: I don't see how we can visit the museum if it's closed.
Classification	(C1) Communicating with team members about the actions performed

For this item, the student must use the simulated web link in the task area to check when the museum is open and then choose the response that communicates the implications of that information to the team. Therefore, to gain full credit, the student must respond to Rachel's proposal and Brad's misinformation, clarifying that the museum is not open on the day scheduled for the class visit.

Part 1 – Sample Screen #7

Rachel confirms that the museum is not open on Thursday afternoon (rescuing any students who do not answer the previous item correctly). She adds a note to the notepad that the selected site must be open on Thursdays from 1-3 pm.

Item	CC101107
Credited Response	We should discuss the market and the car factory.
Classification	(C1) Communicating with team members about the actions to be/ being performed

The credited response reminds team members that they have two additional choices to consider, given that the museum is not open on the required day.

Part 1 – Sample Screen #8

Regardless of the student selection for the previous item, George states that he likes the idea of going to the market.

Item	CC101108
Credited Response	Well, it would give the visitors a feel for our town.
Classification	(B1) Building a shared representation and negotiating the meaning of the problem (common ground)

The credited response acknowledges that George's suggestion meets one of the specified criteria.

Part 1 – Sample Screen #9

Brad proposes the car factory, saying it, too, would give the visitors a great sense of the town – although Rachel disagrees with his statement that it is the town's largest business.

Item	CC101109
Credited Response	Brad makes a fair point. How does the car factory compare with the market?
Classification	(C3) Following rules of engagement

The credited response supports Brad's suggestion, promoting group collaboration, and moves the team forward by prompting the team to compare the remaining options.

Part 1 – Sample Screen #10

George raises a new consideration, noting that the factory is not located near the school.

Item	CC101110
Credited Response	We'd better check how long the trip would take.
Classification	(C1) Communicating with team members about the actions performed

The credited response communicates that George's point requires further investigation, keeping the team on task.

Part 1 – Sample Screen #11

Rachel says that she has checked the car factory website and thinks it would be ok, but asks the team to double check.

Item	CC101111
Credited Response	Student must must click on car factory website in order to receive credit for this response: There's not enough time to get there and back and have everyone take the tour.
Classification	(B1) Building a shared representation and negotiating the meaning of the problem (common ground)

The credited response recognises that the thirty visitors will need to be divided into two tour groups (since the maximum size of a tour group at the factory is 15) This implies that there will have to be two consecutive tours. The need to have two tours, combined with the bus schedule means that the factory fails to meet the constraints set by Ms. Cosmo.

Part 1 – Sample Screen #12

George provides the needed information about the time required for a visit to the car factory. Rachel expresses that she is losing track of the details that have been discussed to this point.

Item	CC101112
Credited Response	We should summarize what we've found out about each site.
Classification	(C2) Enacting plans (C3) Following rules of engagement

The credited response focuses on summarising the team's discussion to reach a final choice.

Part 1 – Sample Screen #13

The student is tasked with summarising what the team has learned about the sites and making a recommendation. The chat history is available to review as is the information from the website for the museum, market and car factory.

Item	CC101113
Credited Response	On the table: all 3 boxes checked for the Market and 5 of the 6 buttons correctly checked for the Factory and Museum Radio buttons: Community open-air market selected
Classification	(C2) Enacting plans (C3) Following rules of engagement

Part 2: Overview

The opening screen of Part 2 presents an email from the faculty advisor, Ms. Cosmo. She presents an overview of the task and defines the key roles.

PISA 2015

The Visit - Part 2
Introduction

Read the introduction. Then click on the NEXT arrow.

You have received the following email message from Ms. Cosmo:

To:	You
From:	Ms.Cosmo
Subject:	Assigning Guides to Visitors

Thanks for recommending a place for our class visit. While the visiting students are at our school they will need guides to help them find their way around, understand what's expected of them, and generally have a positive experience.

Since you took the lead in planning the outing, you don't need to be a guide. Please let George take the lead in suggesting assignments but give him any help he might need.

On the next screen, you will see some instructions to help you with this assignment.

Part 2: Directions

The directions for Part 2 summarise the key criteria that need to be considered when selecting the student-visitor groupings.

- Each team member can act as a guide to a maximum of three visitors
- Each visitor must be assigned to a guide who has studied the visitor's native language
- Guides must be of equal or higher class rank than the visitors assigned to them

The advisor also mentions that it would be desirable to match visitors and guides with respect to outside interests and favorite subjects, but that this is not a requirement.

Note that the attributes for the guides and visitors are such that there are multiple assignment possibilities that will fulfill the three essential conditions.

On the right side of the screen, the table shown below displays. Over the course of the chat, as new information is added and assignments are proposed, the display reflects that conversation.

Part 2 – Sample Screen #1

Item	CC101201
Credited Response	Full credit: It would help to know what languages each of you has studied. Partial credit: George, before you suggest some assignments, can you tell everyone what languages you have studied? Partial credit: Rachel and Brad, what languages have you studied?
Classification	(A1) Discovering perspectives and abilities of team members

Credited responses focus on collecting information about team members' language experience, as guides need to have studied the language(s) of their assigned visitors. The full credit response focuses on all 3 team members; partial credit responses focus just on George or just on Rachel and Brad.

Item associated with alternate path:
While the first option does not move the problem solving forward, it does restate information provided by Ms. Cosmo. If the student selects the first option, George delivers a partial rescue by mentioning his own language abilities. The student then has a second opportunity to suggest that the team provide information about language skills (**item 202**) with chat options similar to those presented in item 201.

Part 2 – Sample Screen #2

Each team member specifies the language(s) he or she has studied and these display under their names, along with their class year and interests.

Part 2 – Sample Screen #3

George suggests visitor assignments and these display under each team member's name.
Rachel points out that Brad might have difficulty guiding 3 visitors.

Item	CC101203
Credited Response	Rachel, Ms. Cosmo asked George to suggest assignments. Are you OK with the ones he suggested for you?
Classification	(C3) Following rules of engagement

The credited response prompts the team to respect Ms. Cosmo's assignment of George as the leader for this task.

Items associated with alternate paths:
If the student selects the first option, George rescues by stating that, "That's not one of the rules Ms. Cosmo gave us.". The student then has a second chance to ask Rachel if she is ok with George's choices (**item 204**).

If the student selects the third option, Rachel rescues by acknowledging that George should make the assignments. The student then has a second chance to ask Rachel if she is ok with George's choices (**item 205**).

Part 2 – Sample Screen #4

Rachel agrees to the visitors she was assigned and Brad agrees that he can act as a guide to two, rather than three, visitors but thinks that he would be a better match for Pablo and Raul based on languages and interests. The display of assignments changes accordingly.

Item	CC101206
Credited Response	I can see you all like the idea, but Ms. Cosmo told us we can't have a first year student as a guide for a second-year visitor.
Classification	(D1) Monitoring and repairing the shared understanding

The credited response reminds the team about Ms. Cosmo's requirement that guides must be of equal or higher class rank than the visitors assigned to them, helping to ensure that the assignments meet the specified criteria.

If a student selects one of the first two responses, Rachel rescues, saying "Well, we forgot that Brad is a first year and Pablo is a second-year. It won't work."

Item associated with alternate path:
If student selects the third option, Brad asks why that matters and the student has a second chance to remind the team that a first year student cannot act as a guide for a second year visitor (**item 207**).

Part 2 – Sample Screen #5

Brad says he didn't realise that Pablo was a second-year student and George suggests the team go with his original suggestion.

Item	CC101208
Credited Response	Are you OK with George's idea, Brad?
Classification	(D2) Monitoring results of actions and evaluating success in solving the problem

The credited response prompts one team member to confirm another's suggestion.

Part 2 – Sample Screen #6

The team members continue to discuss the selections, finally agreeing with George's plan. George notes that this task took longer than necessary and wonders how the team could do better next time.
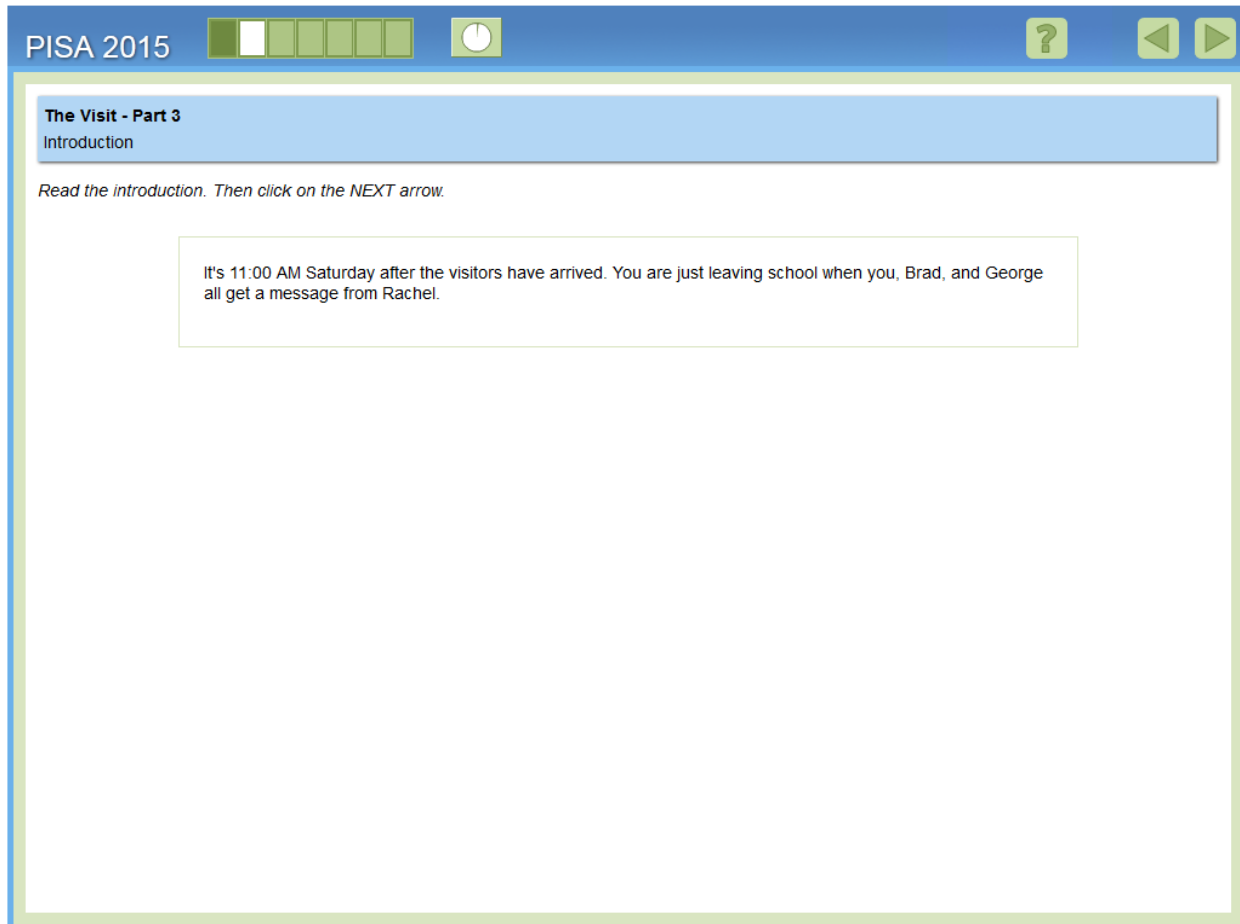

Item	CC101209
Credited Response	Maybe we should pay more attention to what Ms. Cosmo required.
Classification	(D3) Monitoring, providing feedback and adapting the team organisation and roles

The credited response allows the student to reflect on the process and affirm the importance of attending to provided criteria in order to efficiently solve the problem.

If a student selects one of the other options, George concludes part 2, saying, "Well, at least we could agree. I'm looking forward to meeting them."

Part 3: Overview

Part 3 focuses on the task of helping one of the visitors who needs to return home unexpectedly. The previously-made arrangements for taking the visitor to the airport have been upset and the student and agents must intervene. The team must first share information regarding the whereabouts of the visitor and attempt to rendezvous with him and, if possible, locate his lost mobile phone. After the rendezvous, the student and the agents must collaborate to determine the best way to get the visitor to the airport, subject to various constraints.


PISA 2015

The Visit - Part 3
Introduction

Read the introduction. Then click on the NEXT arrow.

It's 11:00 AM Saturday after the visitors have arrived. You are just leaving school when you, Brad, and George all get a message from Rachel.

Part 3: Directions

The directions specify the team's task: to help one of the visitors return home. The information that will display in the task area is also explained: locations of the team members will be shown, the clock will show the time, and notepad will display important information.
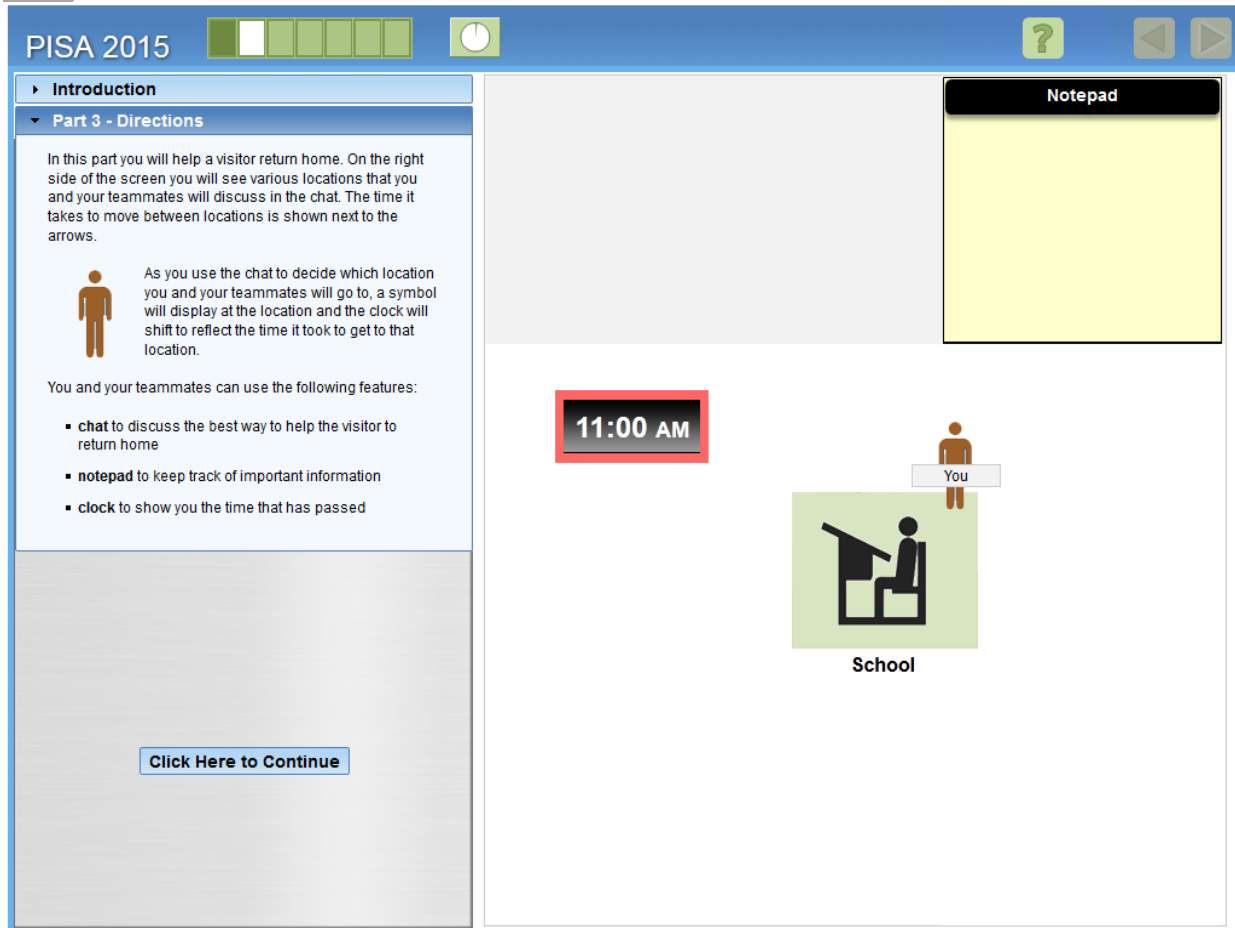
Part 3 – Sample Screen #1

Rachel's message displays and sets out the basics of the problem to be solved by the team.
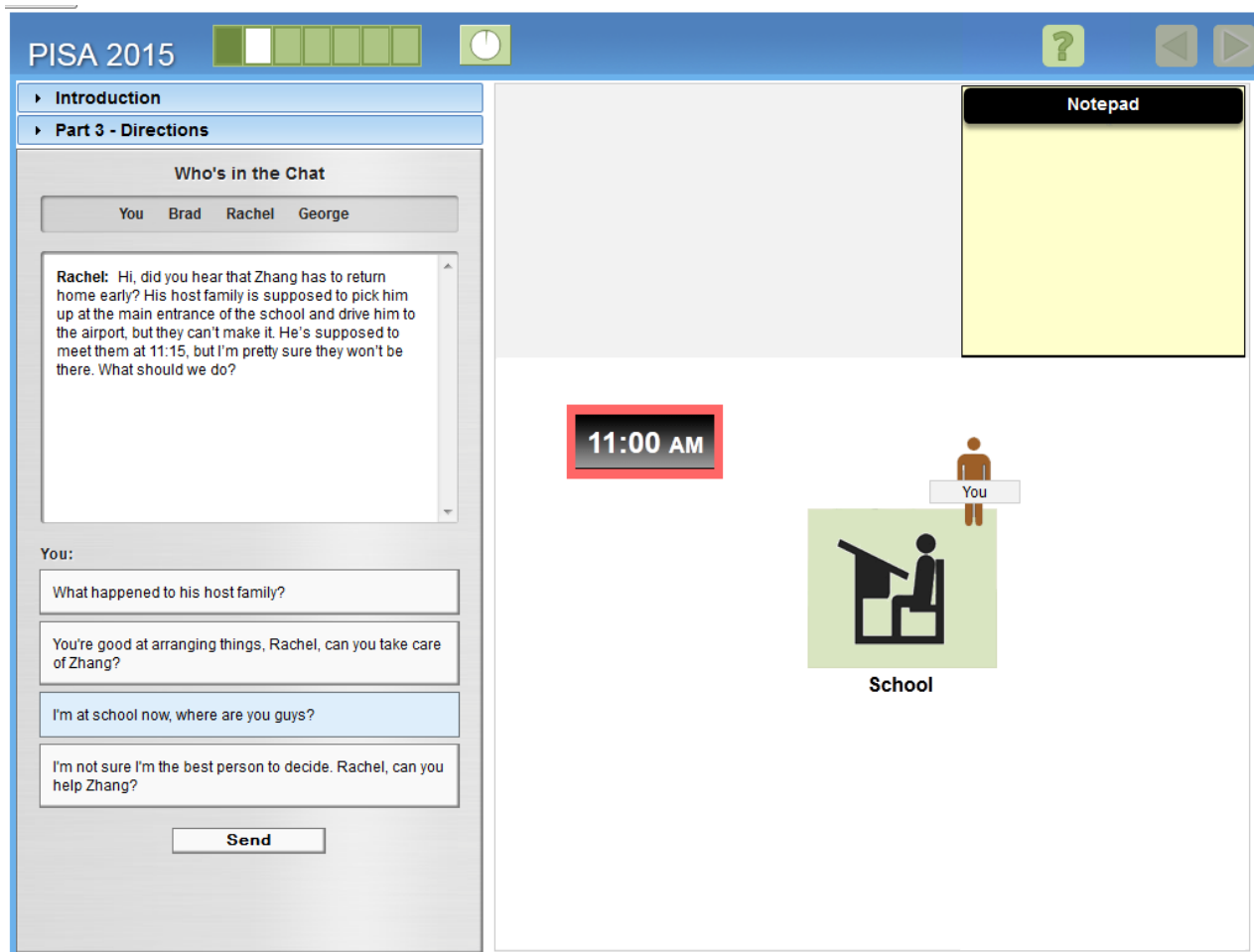
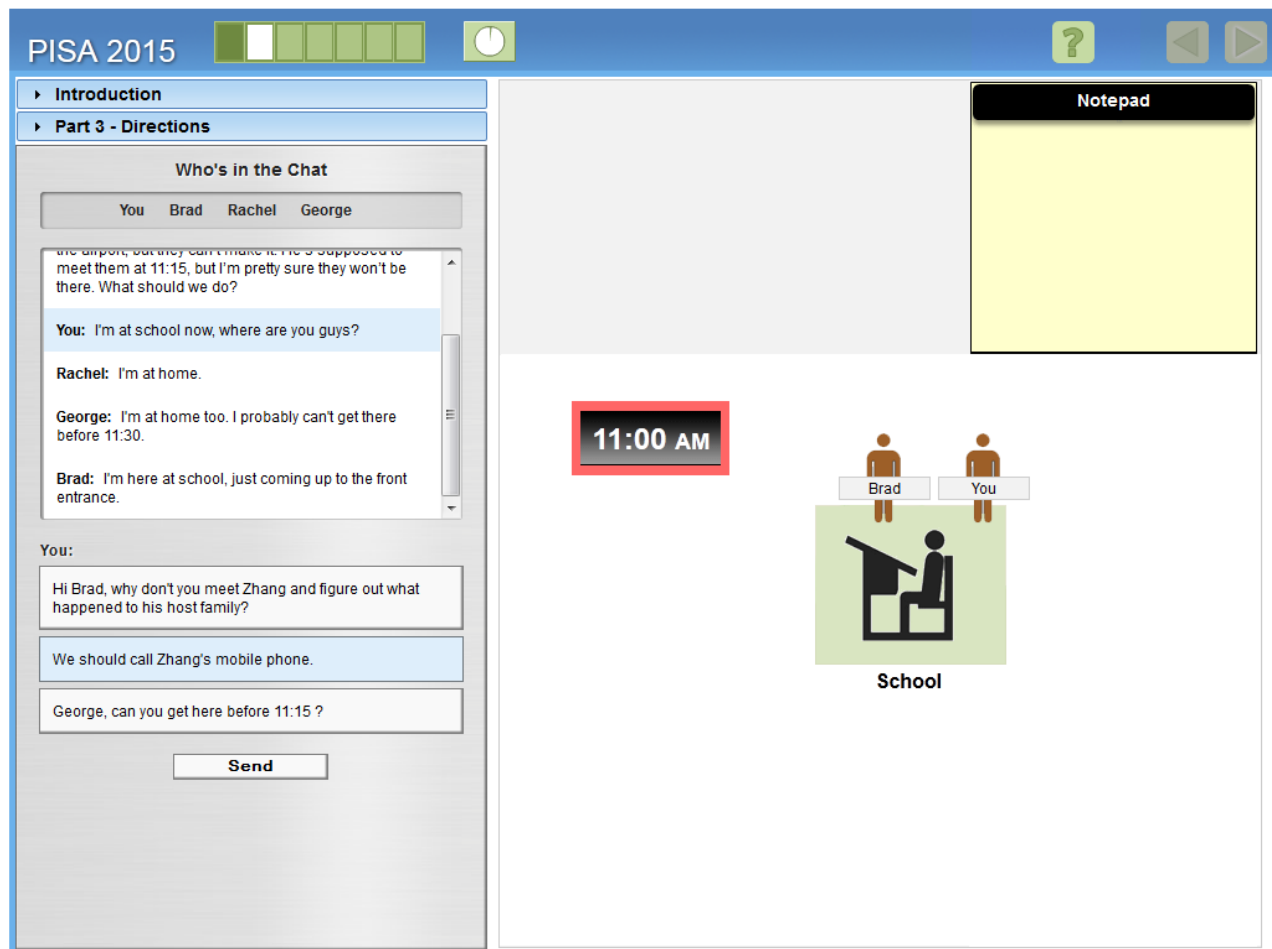| Item	CC101301
Credited Response	I'm at school now, where are you guys? (full credit)
Classification	(B3) Describing roles and team organisation (communication protocol/rules of engagement)

The credited response focuses the team on the first task, determining where everyone is.

Items associated with alternate paths:
- If the student selects the first option, Rachel rescues saying she doesn't know what happened to his host family and asking if you are at school. The student has a second chance to respond about his or her location: "I'm at school, where are you?" (**Item 302** – partial credit)
- If the student selects the second or fourth options, Rachel says she is at home. The student can respond by asking where everyone else is. (**Item 303** – partial credit)

Part 3 – Sample Screen #2

Regardless of the path taken, Brad joins in, saying he is at the school and his icon displays in the task area.
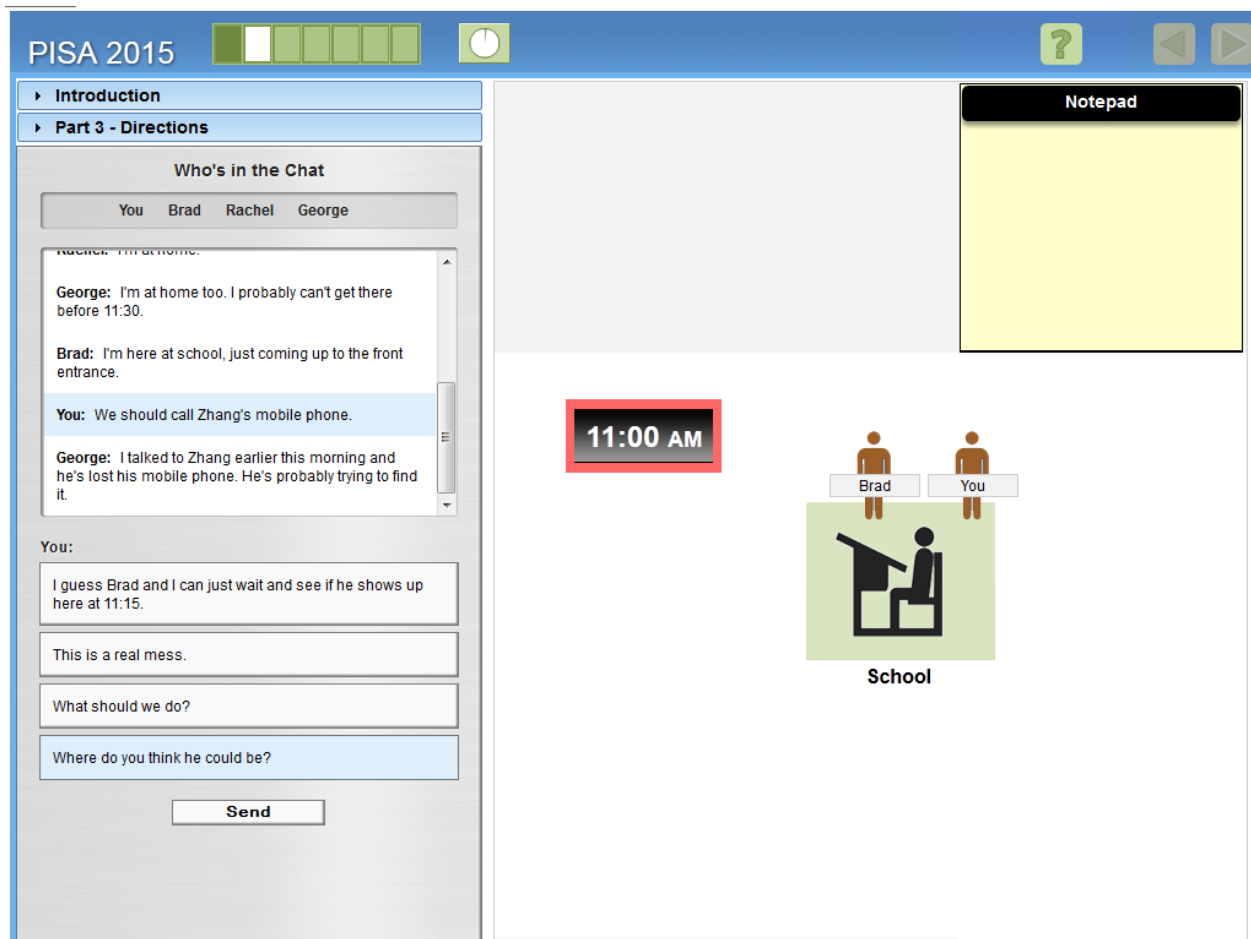

Item	CC101304
Credited Response	Full credit: We should call Zhang's mobile phone. Partial credit: Hi Brad, why don't you meet Zhang and figure out what happened to his host family?
Classification	(A1) Discovering perspectives and abilities of team members

Item associated with alternate path:

If the student selects the third option, George says he can't get to school until 11:30 and the student has a second chance to suggest they try to call Zhang on his cell phone (**item 305**).

Part 3 – Sample Screen #3

George lets the team know that Zhang lost his cell phone and is trying to find it.

Item	CC101306
Credited Response	Two responses are equally credited: What should we do? Where do you think he could be?
Classification	(B1) Building a shared representation and negotiating the meaning of the problem (common ground)

Each of credited responses will elicit an idea from George about how the team should proceed.

Part 3 – Sample Screen #4

George suggests that Zhang is trying to find his phone.

Item	CC101307
Credited Response	Full credit: Brad, why don't you wait here for Zhang, while I go to the Internet Cafe and then the Food Court? Partial credit: Brad, let's just wait here until 11:15.
Classification	(C2) Enacting plans

Items 308 – 311 are associated with a series of alternate actions taken by the student, George and Brad as they decide who should go where to try and find Zhang and his phone.

Part 3 – Sample Screen #5

Regardless of the path taken, Zhang ends up at the school and his phone is located. George brings up a new aspect of the problem – Zhang has missed his ride and needs to get to the airport.

Item	CC101312
Credited Response	Maybe he should, but a taxi will be expensive. Brad, does he have enough money?
Classification	(C2) Enacting plans

The credited response raises a question that the team must take into account when considering transportation options.

Item associated with alternate path:
If the student selects the first or second options, Brad reports that Rachel said the host family wasn't coming and George raises the point that a taxi could be expensive. If the student selects the last option, George mentions that a taxi could be expensive. The student has a second chance to ask if Zhang has enough money for a taxi (**item 313**).

Part 3 – Sample Screen #6

Brad shares the information that Zhang does not have enough money for a taxi.

Item	CC101314
Credited Response	What time is his flight?
Classification	(B1) Building a shared representation and negotiating the meaning of the problem (common ground)

The credited response focuses the team on key information needed to solve the problem.

If the first option is selected, George rescues by asking how long the team should wait.

Selecting the third option lead s to Brad's comment, shown on the following page.

Part 3 – Sample Screen #7

Brad provides information about when Zhang's flight is scheduled to leave.

Item	CC101315
Credited Response	So what other ways are there to get to the airport?
Classification	(B1) Building a shared representation and negotiating the meaning of the problem (common ground)

The credited response helps formulate the problem by asking the team to consider the range of transportation options.

If the student selects any of the other options, George rescues by saying, "We should think of other ways for Zhang to get to the airport."

Part 3 – Sample Screen #8

Brad says that Zhang could take the bus or train, but they are slower. The clock updates to 12:00 and the train station and bus station icons display.

Item	CC101316
Credited Response	How many hours before his flight should he get to the airport?
Classification	(D1) Monitoring and repairing the shared understanding

The credited response to this item advances the shared understanding of the group by seeking a clarification of the actual time constraints.

Part 3 – Sample Screen #9

Brad says that Zhang needs to arrive at the airport at least two hours before his flight.

Item	CC101317
Credited Response	Two equally credited responses: How far away from here are the bus and train stations? Does anybody know? We should check the schedules.
Classification	(D1) Monitoring and repairing the shared understanding

Items associated with alternate paths:
- If the student selects the first credited response (How far away. . .), the student gets a second chance to suggest that the team check the schedules (**item 319**).
- If the student selects the second credited response (We should check the schedules) or the other two responses, Brad provides information about the bus schedule (one leaves at 12:15 and arrives at 1:45) and the student is able to ask if there is enough time to get to the bus station (**item 318**).

Part 3 – Sample Screen #10

Regardless of the path taken, the information about the bus schedule is shared and recorded on the notepad. Brad identifies a potential problem: there may not be enough time to travel by bus.

Item	CC101320
Credited Response	How about the train?
Classification	(C2) Enacting plans

The credited response recognises that the last transportation option should be considered given the potential problem with the bus.

The incorrect responses lead to a rescue by Brad, who suggests that they consider the train.

Part 3 – Sample Screen #11

Item	CC101321
Credited Response	OK, can you check the train schedule, Brad?
Classification	(C2) Enacting plans

The credited response moves the task forward by asking a team member to find information needed to make a decision about the train.

Selecting one of the incorrect options leads to a rescue by George, who asks Brad to check the train schedule.

Part 3 – Sample Screen #12

Brad provides information about the train schedule and that information is recorded on the notepad.

Item	CC101322
Credited Response	How much does a train ticket cost?
Classification	(C2) Enacting plans

The credited response is correct because it has been established that that team needs to consider both travel time and cost.

Part 3 – Sample Screen #13

George rescues to resolve the cost issue saying he will lend Zhang the money if needed and Part 3 is concluded.