Earth Science by Design

Example of "Running Notes"
of a Classroom Session

Here is an example of the kinds of notes you might take in a classroom. From these notes you can then fill out the Observation Guide.

The Context of this Class Session (from prior discussion with the teacher and from reviewing the unit planner)

This class session is part of an introductory unit, *Journey to Planet Earth*. The unit presents Earth science as a voyage of discovery aimed at understanding the planet on which we live. It introduces the Earth system, and the major features of Earth's surface through remote sensing. Students acquire modeling and mapping skills as well as begin to build understanding of the methods of scientific inquiry.

A View from the Classroom

A remote sensed image of Buenos Aires is displayed onscreen to students as class begins. The following questions and directions are posted,
"Where on Earth do you think this image is from? What do you think the image shows? Write down your thoughts on a paper and discuss them with your team." Mrs. X takes a minute to take roll and organize paperwork.

Mrs. X points to the image. "Raise your hands and indicate with your thumb how confident you feel about what you wrote. Ok. We will return to this image at the end of class."

"Remember that one of the *BIG* goals in this course is to use images of Earth from space to help us better understand our planet. We want to think of images as data that we can analyze and interpret, just like we do a table or a graph."

"Let's take a look at our essential questions for this unit*." Mrs. X. points to the bulletin board.* "Today we will focus on the second one,

How do images, maps, and models help us understand the Earth system?"

"As we continue on our journey to Planet Earth, let's examine some remote sensed images of Earth. Today, we will learn to recognize common features, such as roads, rivers, trees, irrigated fields, airports, and the like, as seen from the air. We will also ask questions about why things are where they are. Why is an airport located in one area and not another?" *While talking, Mrs. X is advancing frames of a slide show depicting ground-based views of these features.* "When your team plans its expedition to your chosen volcano, fault or other unique place, you will need to gather and interpret at least three images or maps. You will need to ask questions about what you see. What we learn today will help you with that part of your final project. Even if your team is planning a trip to the bottom of the ocean, as part of the voting public, you will need to be able to recognize the features we study today when you listen to the presentations from other

teams. This will enable you to make an informed decision about whose proposed project should receive funds for further research."

"Think about what you learned about remote sensing yesterday. Remember that a variety of satellites operate and that each specializes in collecting a specific type of data.
Recall and write down one type of information that we collect from these satellites."

Mrs. X then calls on various students.
i.e. "Sarah, would you please share what you wrote? "
Students respond with, "sea surface temperature, movement of storm systems, land temperature, etc." When a student response was incomplete she asked, "Would you explain what you mean?" When he was still unsure, she asked if he needed help and then called upon another student to help him.

"In addition to satellites, space shuttles and planes fly over Earth and take pictures. Today, we will explore some of these more detailed, small-scale images."

Mrs. X. stops talking and distributes papers to the groups. "This is a table of image features." *Mrs. X holds up the table and points to it.* "Here is a reference set of images." *Mrs. X holds up two of the images from the reference set.* "It is your goal to make sure that you and your teammates can identify these features in any remote sensed image. As you work through the questions, *(Mrs. X. holds up the question sheet)* make sure all of your team members are in agreement. There are two parts to the activity. One part uses the printed image set at your desks. The other part uses the computer stations. The class will be split in half. You will have 10 minutes for each part. Teams 1 to 4 will start at the computers. Teams 5 to 8 will remain at the desks. In ten minutes we will switch. After that, you will have 10 minutes to quiz each other on image features." *Mrs. X. has eight groups of four students in this class. She has four computer stations and uses a split class structure. Half of the teams work with the printed images. The other half works at the computer. They switch places after 10 minutes.*

Mrs. X. circulates among the teams as they work through the activity, Finding Features. Students discussed their responses to the question sheet items. In particular, students are overheard discussing these two questions:
Write down something your team cannot identify on at least one of the images.
Write three questions raised by the image.

Activity: Quiz your teammates. Many students turn this activity into a game, pretending they are contestants and game show hosts.

Mrs. X flips the light switch three times. "Ok. May I have everyone's attention? Tomorrow we will share and discuss the questions that today's images raised for your team. We will consider how these images show evidence of Earth's systems." *Mrs. X points to the image of Buenos Aires, now displayed again at the front of the room.* "For now, I'd like for us to return to the image with which we started. Take a minute and look

over what you wrote at the beginning of class. Go ahead and make any changes you'd like or add to what you wrote." *Mrs. X. pauses for a couple minutes, checking to see if students are finished writing.* "Now, raise your hands and indicate with your thumb how confident you feel about what you have now written. "

Mrs. X points to features and asks for volunteers to identify them. After discussing features she asks if anyone thinks they know where on Earth this image is located. Since no one correctly identifies where the image is from, Mrs. X. informs the students of the location of the image. She puts it into a larger geographic context by having students open their texts and find Buenos Aires on a world map.

"What do you wonder about when you look at this image? Think of at least one "I wonder…" statement that this image brings to mind. Share this and any others with your teammates. "

Student responses include, "I wonder what the climate is like for the people who live there and I wonder where the river sediments come from." Noticeably absent are statements like, "I wonder why we have to know this?"

"Recorders, please hand in a list of at least four statements for the team, along with the question sheet for the activity. " Materials specialists from Teams 2 & 6, please collect all the papers." *Recorders hold up a stack of paper for the two team specialists that move from group to group collecting papers. These two students then hand the papers to Mrs. X.*