Workshop 4: Inquiry

In this workshop, Hubert Dyasi will discuss inquiry-based learning in science and explain why it is essential in all subjects. You will see several classrooms where inquiry learning is taking place and explore various inquiry strategies you can use in your own classroom.

HUBERT DYASI

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Workshop 4 timeline

GETTING READY

30 minutes

30 minutes—Pendulum Discussion

For this workshop, you were asked to make two pendulums. In small groups, demonstrate your pendulums, then discuss the following:

What process did you use to design your pendulums?
What (if any) problems did you encounter?

What is the most significant thing you learned about pendulums?
Why is it significant?

What are three questions that you still have about pendulums?

Do you consider the pendulum activity to be an inquiry activity?
What is your definition of inquiry?

WATCH THE WORKSHOP VIDEO

60 minutes

GOING FURTHER

30 minutes

15 minutes—Paper Trusses

In the workshop video, you saw Nancy's students involved in a paper truss activity. How might you take this activity further? What other challenges could you present to extend this inquiry activity in a math or science classroom?

Note: The paper truss activity comes from Coyle, H.P., J.L. Hines, K.J. Rasmussen, and P.M. Sadler, editors, *Science in Action*, Dubuque: Kendall/Hunt Publishing Company, 1999. (In Press)

15 minutes—Revisit Learning Charts

By now, you've had a chance to think about your own learning and your students' learning in many different ways. Think back on some of the avenues we've used to explore learning—the "Going to the Movies" problem, pendulums, your Moon Journal, concept mapping . . . Have your ideas about learning changed at all? Do you have more thoughts? More questions?

Take some time now to add your new ideas and questions to the Learning Chart.

For next time

HOMEWORK ASSIGNMENT

SELF CHECK

Select one of your students and write a brief narrative from his/her perspective answering the question, “How do I learn science/mathematics in this class?” Some questions to guide your narrative might include:

What do I do? What is my job in this class?
What does my teacher do? What is his/her job?
What is the job of the other students in the class?

Now interview the student, asking the same questions. How did his/her actual answers compare to the responses you anticipated in your narrative? Were there similarities? Differences? What do these similarities/differences mean in terms of your teaching? In terms of your student’s learning?

If you have time, interview a second student. Not all students will respond the same way, and it’s sometimes useful to compare answers.

Please bring one of the following games with you to Workshop 5: Checkers, Chinese Checkers, Battleship, Mancala, Yahtzee, Sorry, Parcheesi, Cribbage, deck of cards (Rummy, Hearts, Poker, Go Fish, etc.)

READING ASSIGNMENT

In preparation for Workshop 5, please read “Reform in Primary Mathematics Education: A Constructivist View ” by Constance Kamii. (All readings are included in the Appendix.)

MOON JOURNAL

Moon Journal

Here is something interesting to think about:

Observe the position of the Sun with respect to the Moon in the sky. Does the angle between the Sun and the Moon increase, decrease, or stay the same over your observation period?

Suggested activity

Sun, Earth and Moon Angles

One way to chart the Moon's behavior is to chart its position with respect to the Sun and the Earth. Specifically, you can measure the angle between the Moon and the Sun, with the Earth as the vertex of the angle.

At a time when both the Moon and the Sun are visible, measure the angle between the Moon and the Sun from your observing location. Each time you measure and record the angle, also observe and record the shape (phase) of the Moon, and notice whether the lit or unlit portion of the Moon is nearest the Sun.

CAUTION: **Never look directly at the Sun.**

ESTIMATING ANGLES WITH FISTS

Just as you can use fists to measure the elevation of the Moon (see page 27), you can do the same to measure the angle between the Sun and the Moon. Make a fist with each of your hands and hold them out in front of you at arm's length. Count how many fists make up the distance between the Moon and the Sun.

MEASURING ANGLES WITH A PROTRACTOR

MATERIALS:

Clinometer (see page 29).

INSTRUCTIONS

1. Position your clinometer with the protractor numbers face-up.
2. Point one end of the straw to the Moon.
3. Slide the string along the top of the protractor until it is aligned with the direction of the Sun.
4. Use the numbers along the side of the protractor to calculate the angle between the Sun and the Moon.

QUESTIONS

1. Is the lit or unlit part of the Moon facing the direction of the Sun?
2. Which direction are the "horns" of a crescent facing with respect to the Sun? Does this change as the angle between the Moon and the Sun changes?
3. Do you notice a pattern between the Moon-Sun angle and the phases of the Moon?