Inquiring Minds Want to Know

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Science Updates

Inside this issue:

Creating Effective Formative Assessments

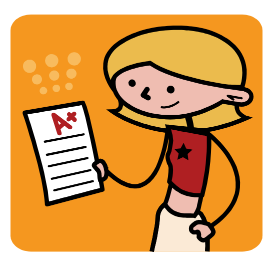
Diagnostic, formative, summative are all terms referring to types of assessments being used in the classroom. Diagnostic assessment is used to gather information about what our students already know, possibly to gain knowledge of their preskills as a new unit of study is started. Formative assessment occurs throughout the learning process and should happen on a daily basis. Summative assessments are typically those high stake assessments, such as unit tests, projects, EOG's, and EOC's.

Creating effective formative assessments is crucial to successful teaching. Two questions can be asked to assist in the creation of the assessment. What information will the teacher gain from a formative assessment? What are effective ways of gathering that information?

Good formative assessments should help a teacher gain knowledge of the students' understanding and monitor students' progress. The information allows the teacher to modify instruction. Not all assessments have to be graded, but students do need feedback. Giving feedback encourages students to continue or extend learning and provides student redirection when necessary.

How can that information be gathered? One of the simplest ways that teachers gather information on student progress is simply a question and answer period during class. Other assessments might include journal entries, quizzes, graphic organizers, completion of checklist/rubrics, written reports, essays, portfolios, benchmarks and formal performance tasks. With inquiry being a important factor in the science classroom, it is important that the teacher look for ways to assess inquiry.

In the January 2008 issue of the National Science Teachers' *Science Scope,* assessing scientific inquiry is addressed. Author, Erin Peters, recommends that peer assessment and self-assessment be used for assessment of inquiry. Peters goes on to say that "this process gives students a chance to summarize their work and to identify any difficulties they may have." Teachers can use these peer reviews and self-reviews to "gather information about students' perception of their progress." On page two of the newsletter, samples of peer-review questions and self-assessment questions from the *Science Scope* article are included . In both types of assessments, the reviewer must probe into inquiry methods to complete the rubrics. These samples questions show that using peer assessments and self-assessments will most definitely make the learner explore the process of inquiry at a more meaningful level. More importantly, the students become a part of the assessment process.



Peer-Review of Inquiry

Student products	Types of communication	How they could be used in assessment
Student-kept records	Written and diagrammatic	Teachers can establish benchmarks to be reached at certain points in the inquiry. When students reach a benchmark, teachers read the student-kept records of the inquiry and provide feedback on completeness of ideas, misunderstandings, scientific processes, and further study.
Portfolios	Written and diagrammatic	Instead of assessing the portfolio of work at the end of the project, teachers could assess the products as they are chosen for the portfolio. At the end of the project, teachers look at the totality of the work in the portfolio for an additional assessment of work.
Journals	Written	Students can write to teachers about the progression of learning goals and teachers can comment on their progress and offer suggestions for additional study.
Rubrics	Written	Students can create their own rubrics to show what they consider to be quality work.
Anecdotal notes	Written	Teachers can observe learning in lab groups and write field notes on student progress, which are shared with students individually to enhance the learning experience in inquiry.
Student-teacher conferences	Oral	Teachers can interview students in a one-on-one setting using the three indicators for inquiry: ways of knowing in science, processes of science, and science content. The assessment journal in Figure 3 can be adapted for this type of assessment.
Student-student conferences	Oral	Students can interview students from other groups in a one-on-one setting using the three indicators for inquiry: ways of knowing in science, processes of science, and science content. The assessment journal in Figure 3 can be adapted for this type of assessment.

Self-Assessment of Inquiry

	Meets expectations	Could use some improvement	Comments (must be filled out)
Ways of knowing in science			
Can you connect all of your ideas with evidence found in the inquiry?			
Did you change your mind about the inquiry? Can you document how this happened?			
Would you make any changes in your procedure based on what you know now?			
How much research did you do to find out about your topic?			
Processes of science			
Are your observations as detailed as you can make them?			
Did you use the best tools to make measurements in the inquiry? Did you do research to find other tools that measure the same quantities? Could your data be more precise when you use these other tools?			
How did you know that your question that guided the inquiry was testable?			
Did you think of other questions as you progressed through the inquiry?			
Can you explain why your plan for inquiry was the best one for you?			
Could you communicate your processes, ideas, or results differently?			
Content			
Note to teachers: Use local standards to indicate student understanding of content.			

And the Winner Is... Science Fair News

The Guilford County Schools County Science Fair was held on February 6, 2008 at Oak Hollow Mall in High Point. Student projects from elementary, middle, and high schools in the district were displayed and judged during this event. Middle School and High School projects are divided into five categories of awards including biological, earth/space science, physical science, engineering/technology/applied science, and general science. The first place winners in each category will compete in the regional competition at SciWorks in Winston-Salem on February 22. Thank you to all teachers that assisted students with the completion of these outstanding projects. Congratulations to our middle and high school winners.

Projects advancing to regionals:

- Justin Erickson Kernodle
  Can Money Make You Sick?
- Ryan Gresalfi Mendenhall
  More Motor Mojo
- Kaila Hill Southeast Middle
  How Does Rye Grass Grow?
- Jessie Mayhew and Allison Deaton
  Brown Summit Middle
  Achy, Breaky Heart
- Nicole Shaw Aycock Middle
  Is "Green" Really Clean
- Mark Draelos Early College @ Guilford Does at Risk Photobehavior Lead to Atypical Nevi in Adolescents & Young Adults?
- Mark Hendrick, Jr. Northwest HS
  Development of Ultralight Materials for Use in Micro-Air Vehicle Wings
- Kyle O'Donnell Southwest HS
  Comparing the Effectiveness of Wind Turbines & Tidal Turbines

Surfing the Web for Good Science:

Teachers were asked to submit their favorite websites for teaching science and many of you have suggested some excellent sites. If you do not see your favorite website, please send it in to be included in a future science newsletter.

General Topics (mostly for middle school)

http://www.howstuffworks.com/

www.middleschoolscience.com

www.sciencespot.net

www.kineticcity.com

Biology (life sciences)

http://www.actionbioscience.org/index.html

www.cellsalive.com/

www.biology.arizona.edu/default.html
www.phschool.com/science/biology_place/biocoach/index.html
www.microbes.info/general/about.html
http://www.biologycorner.com/

http://www.johnkyrk.com/

http://www.teachervision.fen.com/tv/printables/Gummy_Bear_Genetics.pdf

http://www.sf.adfg.state.ak.us/region1/amphib/anatomy.cfm frog website--excellent to use w/ dissection or virtual dissection

http://media.pearsoncmg.com/bc/bc_marieb_ehap_8/activities/index.html

http://www.innerbody.com/htm/body.html

http://warriors.warren.k12.il.us/dburke/human_body_fact_sheet.htm

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Inquiring Minds Want to Know

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Guilford County Schools
STRIVING. ACHIEVING. EXCELLING.

Dates to Remember:

High School Science Department Chairs and Middle School Science Contacts Meeting

February 21 4:30-6:30 Washington Street, Room 306

Biology Teaching and Learning Session

February 28 & March 13

4:30-6:30 Washington Street, Room 300

Earth/Environmental Science Teaching and Learning Session

March 3 4:30-6:30 Page High School room 602

April 8 4:30-6:30 Southwest High School room 223

Regional Science Fair

February 22 SciWorks Winston-Salem

State Science Fair

March 15 Meredith College Raleigh

NCSTA District Directors will be hosting a regional one-day conference in preparation for the 2008 NSTA Regional Conference in Charlotte. NCSTA members attend for free ($8.00 for lunch)

When: **Saturday, April 19** 9:00-3:00
Where: Webster Center, 110 Corning Road, Suite 200, Cary, NC 27518
For more information www.ncsta.org NCSTA Membership $25.00/year

Surfing the Web Continued...

Earth/Environmental Sciences

http://www.ucsusa.org/global_warming/
http://www.epa.gov/ogwdw/kids/teachers_9-12.html
http://www.epa.gov/climatechange/kids/
http://www.ucmp.berkeley.edu/fosrec/McKinney.html
http://www.ucmp.berkeley.edu/fosrec/MunGun2.html
http://www.ucmp.berkeley.edu/fosrec/Breithaupt2.html
http://www.ucmp.berkeley.edu/fosrec/BarBar.html
http://www.ucmp.berkeley.edu/fosrec/MunGun3.html
http://www.woodrow.org/teachers/bi/1995/allinrocks.html

Physical Sciences (Physics and Chemistry)

http://www.fordhamprep.org/gcurran/sho/sho/index.htm
http://www.webelements.com/
http://www.chem4kids.com
http://www.uky.edu/Projects/Chemcomics/

Environmental Symposium-2008

"The State of Our State: Wild Things in NC"

Sponsored by UNCG Department of Biology

Friday March 28, 2008 (GCS spring break)

1:00-5:00 PM UNCG Campus

Contact Elizabeth Lacey eplacey@uncg.edu

"Come R.O.V. With Us"

NC Museum of Natural Science Raleigh

Learn about current research/technology being conducted off the coast of NC.

Saturday March 1, 2008 9:00-4:00

Cost $15 (includes lunch, book, materials)

To register: contact MT Fore -919-733-7450

mary.palmer@ncmail.net