

Bay Science Resource Page

Standards

- **ODE Model Curriculums .**
 - [prek -8 Model Curriculum Document](#) (pdf)
 - [High School Model Curriculum Document](#) (pdf)
- [ODE Comparative Analysis Document](#) - What is NEW what is SAME what is LEAVING grades k-8
- [ODE Gap Analysis Tool](#) - NEW
- [Ohio Resource Center](#) find current standards, resources for best practice lessons and assessment items.
- Common Core [College and Career Readiness Standards](#) - Literacy/Writing in Science (begins on p 60 of this pdf.)
- [Common Core k-12 Crosswalk - Sorted by Grade \(strand and topic\), Strand \(grade and topic\) or Topic \(grade and strand\)](#) and College and Career Readiness Literacy Standards gr 6-12
- [Literacy Standards for Science gr 6-12](#) (Spiral Curriculum Model - ESC)
- **NEW** [Science Cognitive Demands Overview from ODE](#)
- AP Physics Framework
http://media.collegeboard.com/digitalServices/pdf/ap/2012advances/11b_4615_AP_Physics_CF_WEB_120910.pdf
 - AP Physics Online Community
<https://apcommunity.collegeboard.org/web/apphysics/home>
 - AP Physics 1 Instructional Planning Guide -would be helpful for looking at textbook alignment
http://media.collegeboard.com/digitalServices/pdf/ap/ap_physics1_2page_course_overview.pdf and
<http://media.collegeboard.com/digitalServices/pdf/ap/2013advances/ap-physics-1-cppg-bundy-2013-lkd.pdf>
 - AP Physics 2 Overview and Planning Guide
http://media.collegeboard.com/digitalServices/pdf/ap/ap_physics2_2page_course_overview.pdf
 - AP course audit website
<http://www.collegeboard.com/html/apcourseaudit/teacher.html>
 -

Inquiry Approach to Science

- [Scientific Inquiry - home page for ODE](#)
- [Ohio Resource Center Lesson On How To Build Inquiry Lessons For Your Class](#)
- [Article on Steps to Inquiry Based Classroom](#)
- [Bay Schools Definition of What Inquiry Is In Our Classrooms](#)
- [Learner.org Professional Development Series - Inquiry Teaching](#)
- [eMints Teaching Through Inquiry lesson resources](#)

- Example of an ePub Book for Inquiry Science - through “story telling” written by Stephanie Nowak, Mentor Schools.
<http://www.epubbud.com/book.php?g=S9EAE8E5>
- [Guided workshop on learning to teach through inquiry](#) - Materials for Lake Erie Science Center Workshop
- [Science Inquiry Continuum Rubric - Option 1](#) - concise
- [Science Inquiry Continuum Rubric - Option 2 - more detailed](#)
- [Science Inquiry - The Verbs of Science](#), Changing How We Think About Teaching
- [Differentiating Instruction For Science Inquiry](#)
- [Science Inquiry - PowerPoint with Rubrics for Students and Inquiry Learning Cycle](#)
- [WVIZ Physical Science Video labs - for inquiry](#) This is the [TEACHER RESOURCE](#) page to go with the video labs. Focus is on Air Pressure, Density, Forces and Motion and Energy.
- Data Graphing Tool - <http://illuminations.nctm.org/Activity.aspx?id=4098>

Children’s Science Books For Grades k-6

- [Picture Perfect Science](#) - book list by science strand Developed by Karen Ansberry and Emily Morgan

Science ACT College Readiness Standards For Science

- [ACT Standards rubric](#) pdf
- [ACT Standards rubric](#) interactive

Literacy and Writing Across the Curriculum

- [Graphic Organizer Templates](#)

Science Performance Task Resources

- [How to Create a Performance Task](#) Step by step guide to help you build your own task, then how to [create a rubric](#) to evaluate student work. Use the brown navigation bar on the screen to move to each step in the process, includes examples of student work.
- PALS Tasks - (Aligned to the National Science Standards) National Science Foundation
 - [Grade K-4 Performance Tasks](#)
 - [Grade 5-8 Performance Tasks](#)
 - [Grade 9-12 Performance Tasks](#)

Science Content Resources

All Grades

- [PHET](#) Interactive science simulation tools - biology, geophysical, chemistry
- [Wonderville](#) - From the Science Alberta foundation (Canada) appropriate for MS science, lots of interactive activities and inquiry based thinking

- [Science NetLinks](#) lessons, interactive tools, best practice ideas. Also searchable through Thinkfinity.org
- Sas Curriculum Pathways - <http://www.sascurriculumpathways.com>
- [Ohio Resource Center Science Page](#) Use this page to find lessons, assessment ideas and inquiry activities.
- [Exploratorium Explore Resources](#) - interactive or inquiry lessons for all grade levels.
- [NOVA](#) Interactive science resources
- [TeachersDomain.org](#) Video and flash resources pulled from Public Television resources. You can create a free teacher account and set up a bookbag of favorites. Work through the filter. Most video clips come with a transcript and discussion questions
- [McREL Science Lesson Plans](#) arranged by strands and content statements
- Science NetLinks (from the NSTA) <http://sciencenetlinks.com/>
- Energy Education - Resources by grade level <http://www.need.org/curriculum>

Reading In the Content Area

- [New York Times Science and Special Reports](#)
- [New York Times Learning Blog](#) - lessons for science
- [Science News for Kids](#)
- [Science Daily News](#) research studies, new findings explained in more approachable language than a journal article.
- [Science Friday Blog](#) - has articles, audio files and videos

Online Texts

- [CK12.org](#) Free - Flexbooks, online textbooks for science and math. Allows you to pick and choose chapters from a variety of books to build your own custom textbook, books can be viewed as pdfs.

Elementary Lesson Resources

Pre-K

Kindergarten

1st grade

- [Wildlife Guides For Ohio](#) - ODNR page

2nd grade

- **Magnetism**
 - [Magnet Man Experiments](#)
 - [Science NetLinks - Experiments with Magnetism](#)

3rd grade

- Fossils
- [Iditarod](#)

4th grade

- Physical Science - Macroscopic Understanding of Conservation Matter
 - START HERE TEACHER PREP - [Video overview](#) - Conservation of Matter + Physical Change
 - Closer look - features common misconceptions

- Children's ideas - focuses on starting with where kids are in their understanding of science of matter.
 - Activities - Conservation of Matter packet, Hot and Cold lab
 - Problem with plastics - matter can't be created or destroyed. Problem with plastic - where does it go?
- Physical Science - Electricity, Magnetism - Delta Modules
 - [Interactives on line - model circuits](#)
 - [Making circuits using play-dough](#) - squishy circuits.
 - [website with recipes](#)
 - order the kit with the lights, motors etc. <http://squishycircuitsstore.com/kits.html>
 -
- Physical Science - Heat - Scott Foresman Unit.

Middle and High School Lesson Resources

- [SAS Curriculum Pathways](#) Interactive Tools and Simulators. Use the login wash33mind and no password to have students access these tools. See Char to set up a teacher account. Click on Search All Categories - then SCIENCE to find interactives, inquiry activities, audio tutorials and web lessons.

5th grade

- Food Chain Interactive http://www.bbc.co.uk/schools/gcsebiteize/science/ocr_gateway/understanding_environment/energyflowrev2.shtml
-

6th grade

7th grade

- Lesson Ideas for Thermal Energy -and transfer of energy
 - http://www.ucar.edu/learn/1_1_1.htm
 - What is the structure and composition of the atmosphere?, How does solar energy influence the atmosphere?,How does the atmosphere interact with land and oceans?, How is heat transferred throughout the earth system?
 - [Teacher Background Material on Heat and Thermodynamics](#)

[8th grade Science Resource Page](#)

- [Science Daily Articles](#)

9-10 grade

- [UC Berkeley Understanding Evolution](#)

11-12 grade

General Science Resource Sites

Life Science

- [The Encyclopedia of Life](#) Web based tool that allows you to search by common name, scientific name, taxa. Contains media resources, maps of ranges, overview of the species, links to research and more. This is a wiki style resource so scientists and researchers are able to add to and update info. It is then reviewed for accuracy.

Examples of Real Scientists Doing Real Science - use to teach inquiry

[Ohio State - Honeybee Research - The Wilds](#) (youtube video OSU channel)

[SCIENCE INQUIRY RUBRIC](#) - model selected by the team at December Meeting

Developing a Rubric to Help Plan Inquiry Activities:

We talked about creating a rubric that would help us plan science activities as we begin to build our learning progressions. This rubric must cover a range from mostly teacher provided/directed to mostly student provided/directed. This tool will also help us to scaffold a lesson. We are in agreement that not every science activity needs to be an inquiry activity and not every science activity needs to focus on all the parts of the inquiry process. We are also in agreement that at the lower grade levels, it is possible that the students may rarely be at the student directed end of the rubric, especially at first when we begin to implement the new curriculum. (**quote from article I handed out** -Inquiry lessons are described as partial when one or more of the five essential elements of inquiry are missing. For example, if the teacher demonstrates how something works rather than allowing students to discover it for themselves, then that lesson is regarded as partial inquiry. Lessons that vary in their level of direction are needed to develop students' inquiry abilities. When young children are first introduced to inquiry lessons, they are not developmentally or academically ready to benefit from full inquiry lessons. Partial or guided inquiry lessons usually work for them then. Guided inquiry may also work well when the goal is to have students earn some particular science concept. In contrast, a full or open inquiry is preferred when the goal is to have students hone their skills of scientific reasoning.)

I made up some possible questions that a teacher USING our rubric might think about when planning a lesson.

Guiding Questions:

- What piece(s) of the inquiry process do I want to focus on through this activity?
- At what level of teacher or student involvement will I introduce this piece?
- At what level of teacher or student involvement will the other inquiry pieces be included, if they are included?
- What prior knowledge might my students be able to draw on to complete the activity?
- What supports might I have to put in place for students whose level of mastery is above or below the what is needed to do this activity?

October Science Team Homework...read about inquiry science -use the article I gave you along with the other inquiry links on this page. ([article link](#)) Look at the basic rubric from our handout - put some thought into how we could create our own. ([handout link](#) scroll down to the table) Be prepared to actually build a rubric at our next meeting.

BAY STEM ACADEMY - RESOURCES