

INSPIRE GK12 Lesson Plan



Lesson Title	Microscopes: Is what you see, what you got?
Length of Lesson	Four (50 minute) class periods
Created By	Will McBryde, Rob Thornton
Subject	General Science
Grade Level	8 th grade
State Standards	8 th : 1a, b, c, d, g, h (Inquiry)
DOK Level	DOK 3
DOK Application	Hypothesize, Investigate, Compare, and Draw Conclusions
National Standards	5-8: A (Inquiry); E (Technology)
Graduate Research Element	Technology involved is used in research to determine grain size, grain type, and porosity.

Student Learning Goal:

MS 8th Grade:

1(a)(d) Form explanations and analyze conclusions from an investigation (b) make inferences based on observations (c) Proper use of microscope technology (g) Justify a scientist's need to revise conclusions after encountering new experimental evidence that does not match existing explanations (h) Analyze different ideas and recognize the skepticism of others as part of the scientific process in considering alternative conclusion

National Science Education Standards of Content 5-8:

A: inquiry: use appropriate tools and techniques to gather, analyze, and interpret data; think critically and logically to make the relationships between evidence and explanations.

E: design a solution or product; Evaluate completed technological designs or products

Materials Needed (supplies, hand-outs, resources):

PowerPoint file (INSPIRE_McBryde_07.12.10_PP);

Word file (INSPIRE_McBryde_07.12.10_Notes);

Word file (INSPIRE_McBryde_07.12.10_Assessment);

laptop; projector; portable SEM; student samples; hand lenses; Proscopes; compound light microscopes; slides (normal and depression); pond water

Lesson Performance Task/Assessment:

Formative:

Identify parts of compound light microscope; Distinguish between different types of microscope technology available; Collect, prepare, and view samples under hand lens, Proscope, and compound light microscope

Summative:

Formal written assessment



Lesson Relevance to Performance Task and Students:

The lessons and performance tasks will increase student's interests in science through the use of microscope technologies. Students will recognize that observation is not limited to the ability of the human eye because assessments can be enhanced through technology.

Anticipatory Set/Capture Interest:

Students will get into teams (3-4 students per team). The instructor will display, via a PowerPoint slideshow, images of samples viewed under the microscope at Mississippi State University (MSU) Scanning Electron Microscope (SEM) lab. The student teams will observe the images and make educated guesses as to what they see. After completing the PowerPoint slideshow the instructor will review the images and reveal the images identity.

Guided Practice:

Day One: Presentation and discussion of MSU SEM lab images; Lecture presentation based on the PowerPoint; Guided note taking

Day Two: Review microscope use techniques (hand lens, compound light microscope); Demonstrate slide preparation

Day Three: Instructions on proper use of Proscopes; Instructor led demonstration on table top SEM

Day Four: Before testing, a review game will be played. Instructor will toss a ball to a student and then ask that student a question pertaining to the assessment information.

Independent Practice:

Day One: Group inquiry – See Anticipatory Set / Capture Interest, note taking – teacher will provide the note taking sheet and students will fill in the details as the PowerPoint is presented.

Day Two: Make slides of samples provided by students; Make slides of pond water samples; Use hand lens and compound light microscope

Day Three: After being given instructions on Proscopes, students will observe the samples from the previous day to further explore their samples and compare/contrast varying scales in regards to the different technologies.

Day Four: Individual written assessments



Remediation and/or Enrichment:

Remediation: Individual IEP; Make PowerPoint presentation available to resource teacher

Enrichment: Review game before assessment; Field trip to Electron Microscopy Center at MSU

Check(s) for Understanding:

Observation of student activity in lab; Summative assessment

Closure:

Day One:

Oral review on key elements from the PowerPoint; Inform students to bring in samples to use in the lab on days two and three

Day Two:

Answer student questions; Ask students questions; Identify samples to be used the following day with Proscope and table top SEM

Day Three:

Informative explanation of written assessment (i.e. test format) for following day

Day Four:

Introduce next topic

Question 1: Express what specimens were best viewed under the microscope and why?

Question 2: Decide what tasks are microscopes used for in the “real world”?

Possible Alternate Subject Integrations:

Math, Biology

Teacher Notes:

Microscope technology is being checked out from the Electron Microscopy Center at local university (MSU).

This lesson could be used with middle and high school students.