**Thurs 8/28 week-3**

**TOPIC:** the NATURE of SCIENCE

**OBJ:** 1, 8-9

**DO NOW:** Work on Objectives 1-9!!

**EXT:** Metric System Practice

**DUE DATE:** 8-29

**DW:** POGIL Activity Part 2

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**AGENDA**

- Class Website
- POGIL Part 2

**HANDOUTS to PICK-UP:**
- POGIL Activity

**TURN IN to ABS box:**

**SEMINAR 2:**

**BEFORE/AFTER SCHOOL:**

**ABSENT**

✓ DW-self grade POGIL part 1

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**EXIT:** Explain how your group did well with POGIL roles & discuss how they can improve. BE HONEST!!!
http://teachers.olatheschools.com/ecoahanonw/
2-WHAT IS EXPECTED
-organized / labeled

1-ALMOST WHAT IS EXPECTED
-MOSTLY organized / missing some key parts

0-NOT WHAT IS EXPECTED
-NOT organized / TOO many items missing
Write this in RED PEN

LEVEL OF UNDERSTANDING

1.2 Application Notes

DW GRADE: □2 □1 □0
UNIT OBJECTIVES

1. EXPLAIN/IDENTIFY what is involved in an INQUIRY-based lab/activity

8. COMPARE & CONTRAST an observation and an inference

9. IDENTIFY/SEQUENCE the flow of scientific method

Add on to each QUESTION every night as REVIEW!
PERFORMANCE ASSESSMENT

COLLABORATION PROCESS

PROCESS-ORIENTED-GUIDED-INQUIRY-LEARNING
POGIL ROLES

1 - FACILITATOR / TIMEKEEPER
- keep group ON TASK / FOCUSED
- takes care of TIME MANAGEMENT
- makes sure ALL VOICES in group are HEARD

2 - SPOKESPERSON [COLORED PAPER]
- COMMUNICATES group QUESTIONS/CLARIFICATIONS w/ INSTRUCTOR
- ENSURES ALL MEMBERS have had the OPPORTUNITY to RESPOND before asking outside sources
- ENSURES that EVERYONE in group AGREES on WHAT QUESTION to ask if outside source needed
- PRESENTS CONCLUSIONS of the group to the class, as requested

3 - SCRIBE [ANSWER KEY- lead discussion of GRADING/REVIEW]
- TEAM NOTE-TAKER / TEAM “GRADER”
- LEADS team in REVISIONS

4 - QUALITY CONTROL / CHECKER
- GUIDES consensus-building process: group must AGREE on RESPONSES
- VERIFIES that ALL individual responses are CONSISTANT
- ENSURES that ACCURATE REVISIONS happen during/after class discussions
LAB GROUP (3-5 students)
- working TOGETHER as a cooperative group to COMPLETE TASK
- EVERY TEAM MEMBER has a job and participates EQUALLY
  1- READ THROUGH EACH TASK (silently or together)
  2- DISCUSS (use POSITIVE communication)
  3- ANSWER
  4- MOVE ON (only when ALL team members understand)

QUESTIONS ’s
- each other

CLARIFICATION
- Asking Mrs. Cohan for clarification NOT answers.

FYI
- discussion within COLORED group ONLY
INTRO POGIL

Questions

Define the problem

Form a study question

Communicate with the wider community

Reflect on the findings

Analyze the results

Experiment and gather data

State the expectations (hypothesis)

Research the problem

Observe
What do scientists do?

1. IDENTIFY the central theme of all scientific inquiry as shown in Model 1?
   - QUESTIONS

2. IDENTIFY how many activities scientists engage in as part of scientific inquiry.
   - 9
3-CLASSIFY: which of the activities would require a scientist to make some obsv?

- QUESTIONS  - OBSERVE  - RESEARCH  - EXP & GATHER DATA

4-CLASSIFY: which of the activities would require a scientist to gather data?

- OBSERVE  - RESEARCH  - EXP & GATHER DATA
5-SPECULATE: considering the activity described as “communicating with the wider community”, in what ways might a scientist communicate?

- talk to other scientist
- publish papers/reports
- talk with TV/ newspaper

COMMUNICATING isn’t always formal / written

6-CLASSIFY: remembering that scientists often work in teams, which activities would require a scientist to communicate with others?

- communicating with community
- research problem
- exp & gather data
- reflect on findings
7-Given your responses to Q’s 1-6, do you think these activities must be carried out in a specific order or can multiple activities be carried out at the same time?

-NO SPECIFIC ORDER

-JUSTIFY your response by giving examples to SUPPORT your answer.

-many activities overlap / occur simultaneously
The table below represents the ideas the Italian scientist Francesco Redi (1626–1698) might have had as he was carrying out his experiments. The questions that follow the table relate to the process Redi may have used.
8-IDENTIFY: what year did Redi carry out his experiment?

- 1668

9-DESCRIBE the accepted theory during Redi’s time explaining the origin of the flies.

-the flies were thought to be generated from nonliving things such as rotting meat.

10-NAME: what was this theory called?

- spontaneous generation
11-IDENTIFY: how many experiments/jars did Redi set up the first time? -2

12- DETERMINE: what was the purpose of having one jar left open and the other one sealed?

-to compare the two pieces of meat
-to show that even meat NOT exposed to air could generate flies/maggots
13-INFER: why did Redi carry out another experiment with three jars?

- after 1st experiment his obs/data caused him to refine question.
- therefore, he had to further experiment & gather more data
### REDI’s EXPERIMENT

14-COMPLETE: using the nine activities from PART 1, complete the table in PART 2 for each of the processes Redi completed in his investigation.

<table>
<thead>
<tr>
<th>Discovery of flies and maggots on a piece of meat.</th>
<th>Scientific Inquiry</th>
</tr>
</thead>
<tbody>
<tr>
<td>Where did the flies and maggots come from?</td>
<td>OBSERVE</td>
</tr>
<tr>
<td>Are the maggots and flies “related”?</td>
<td>QUESTION</td>
</tr>
<tr>
<td>Gather information about the origins of flies and maggots. The year is 1668 and no scientific studies are available, but the common belief is that living things such as flies can be generated from nonliving things, such as rotting meat. This belief is known as spontaneous generation.</td>
<td>RESEARCH</td>
</tr>
<tr>
<td>Does meat spontaneously generate flies and maggots?</td>
<td>FORM STUDY Q</td>
</tr>
<tr>
<td>If I leave a container of meat open and seal another container, then both should create flies and maggots.</td>
<td>STATE EXPECTATION</td>
</tr>
<tr>
<td>Set up two containers with meat; one will be open and one will be covered. Leave them for several days.</td>
<td>EXP&amp;GATHER DATA OBSERVE</td>
</tr>
<tr>
<td>Flies and maggots are found in the jar with no cover (1) but not in the covered jar (2).</td>
<td>ANALYZE RESULTS REFLECT on FINDINGS</td>
</tr>
<tr>
<td>Was the reason for no flies in the second jar due to the “bad air” being sealed in the jar, which stopped the flies and maggots from being generated by the meat?</td>
<td>REFLECT on FINDINGS</td>
</tr>
<tr>
<td>REFORM STUDY Q</td>
<td></td>
</tr>
<tr>
<td>Run the experiment again adding a third jar with a fine mesh cover. Flies and maggots are only found in the open jar.</td>
<td>EXPERIMENT</td>
</tr>
<tr>
<td>OBSERVE</td>
<td></td>
</tr>
<tr>
<td>Flies lay eggs on the meat, which hatch into maggots, which become flies.</td>
<td>REFLECT on FINDINGS</td>
</tr>
<tr>
<td>Flies lay eggs on the meat, which form maggots which become flies.</td>
<td></td>
</tr>
</tbody>
</table>
15-STUDY the diagrams above of another famous experiment by French chemist and microbiologist Louis Pasteur (1822-1895), which fully refuted the idea of spontaneous generation. CREATE a table similar to the one in PART 2 to outline the experimental processes that Pasteur carried out.
### PASTEUR’s EXPERIMENT

<table>
<thead>
<tr>
<th>PROCESS</th>
<th>SCIENTIFIC INQUIRY</th>
</tr>
</thead>
<tbody>
<tr>
<td>Discovery of bacteria in the flask of broth</td>
<td>observation</td>
</tr>
<tr>
<td>Where did the bacteria come from?</td>
<td>question</td>
</tr>
<tr>
<td>Gather info about the spread of bacteria</td>
<td>research</td>
</tr>
<tr>
<td>Do the bacteria come from the broth or from air?</td>
<td>form a study question</td>
</tr>
<tr>
<td>If bacteria come from the air, then they will only grow in the broth when it is exposed to air</td>
<td>state the expectation</td>
</tr>
<tr>
<td>Bacteria grow in the flask with broken neck after several days but did not grow when neck was unbroken. Bacteria do not spontaneously generate from the broth; they are created by the air to the broth.</td>
<td>experiment; observe; gather data</td>
</tr>
<tr>
<td></td>
<td>analyze the results; reflect; communicate</td>
</tr>
</tbody>
</table>
CIRCLE-level of understanding of today’s objective

1-EXPLAIN/IDENTIFY what is involved in an INQUIRY-based lab/activity

8-COMPARE & CONTRAST an observation and an inference

9-IDENTIFY/SEQUENCE the flow of scientific method