

# The AP Biology Summer Inquiry Project (SIP)

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## Background Information

Over the summer, you will become very familiar with the Moodle online learning environment as we use it for the AP Biology summer inquiry project (SIP). Before you get started on your first online assignment, here's a quick guide to finding your way around the Moodle system.

**Announcement Forum** (You are automatically subscribed to this forum): This feature will serve as a biweekly update on Fridays to keep you plugging along through the SIP Lessons.

**Course Syllabus:** This is where you are right now! This document serves as overview of the lessons, topics, assignments, and general time frames for each lesson.

**Lessons:** Each Lesson has a major topic upon which we will explore together. It is important to follow the lessons and their subcomponents sequentially.

**Forums embedded into Lesson:** To develop an online community of our AP Biology Students, you will be directed to **(a)** post your thoughts on various topics, and **(b)** comment on at least two of your classmates' posts. This will lead to discussions filled with new ideas and insights.

**Resources:** Throughout each lesson there are several websites which are also noted in this syllabus.

**My Emails:** Students by default have a no email at email.com address. Students will have to change that default to an email they use frequently. Find participants in the course and find the teacher and send a message. Please use this Moodle forums and Wikis for communications with your classmates as needed. Use your teacher's email for other issues and questions.

**Contact Staff:** This is currently under construction and includes: TAs to assist you and local professionals willing to respond to your questions about scientific research and animal behavior.

## Screen Shot

<sup>1</sup> AP BIO, SIP: Summer Inquiry Project



Work independently to complete the FIVE lessons in Moodle which will take you through the SIP process. Then, as a member of a team of researchers and for the summative assessment regarding your learning about research, experimental design and behavior, work with your lab partners to design, implement and publish on your very own "Train a Pill Bug" investigation.

- Lesson One: The Scientist in YOU!
  - Draw a Scientist--YOU!
  - Your thoughts on Science Methods
- Lesson Two: Animal Behavior
  - Behavior Mechanisms
  - Guppies RS
- Lesson Three: Sifting through Research Summaries
  - Research Summary from Science Daily
- Lesson Four: Time for PILL BUGS!
  - Pill Bug Word Document
  - Experimental Design
  - Final Experiment (One per Pill Bug Explore Team)
- Lesson Five: The Pill Bug Experiment, Abstract, and Poster
  - Finally
  - Sample Abstract for Students to Use
  - FINAL Abstract
  - POSTER Template
  - Final Poster Submission

## Additional SIP Lesson Details:

### **Lesson One:** (Approximate Time 90 minutes)

The Scientist in YOU

Draw YOU as a scientist

Explore Science Methods

<http://www.ncbi.nlm.nih.gov/pubmed/17327589>

<http://depts.washington.edu/rural/RURAL/design/scimethod.html#communicating>

<http://www.nsta.org/about/positions/animals.aspx>

Types of Research—Bench to Bedside

A Vending Machine for Crows

[http://www.ted.com/talks/lang/en/joshua\\_klein\\_on\\_the\\_intelligence\\_of\\_crows.html](http://www.ted.com/talks/lang/en/joshua_klein_on_the_intelligence_of_crows.html)

Reporting Out—the Scientist in YOU!

### **Lesson Two:** (Approximate Time 3 hours)

Animal Behavior

Read UP! Animal Behavior

<http://163.16.28.248/bio/activelearner/50/ch50intro.html>

Can YOU train a dog like Pavlov?

<http://www.nobelprize.org/educational/medicine/pavlov/pavlov.html>

Simulated Design Your Experiment with Digger Wasps

[http://kisdwebs.katyisd.org/campuses/MRHS/teacherweb/hallk/Teacher%20Documents/AP%20Biology%20Materials/Ecology/Animal%20Behavior/51\\_A01s.swf](http://kisdwebs.katyisd.org/campuses/MRHS/teacherweb/hallk/Teacher%20Documents/AP%20Biology%20Materials/Ecology/Animal%20Behavior/51_A01s.swf)

OH MY! What behavior to choose—animations illustrating animal behavior experiments

*Do varying prey sizes impact foraging in blue gill sunfish? introduction, animation, conclusion, quiz*

<http://bcs.whfreeman.com/thelifewire/content/chp53/5302002.html>

*The cost of defending territory...lizards*

<http://bcs.whfreeman.com/thelifewire/content/chp53/5302001.html>

*Simple Stimuli Trigger Fixed Behaviors Herring Gull Chick Feeding Behavior; Begging Behavior is the fixed behavior and stimulus is the red dot on the parent's bill (excellent graph)*

<http://www.sumanasinc.com/webcontent/animations/content/behaviors.html>

Blind as a Bat—the historical discoveries of biosonar

<http://www.biosonar.bris.ac.uk/>

GUPPIES—student practice writing out a research project using the research described

<http://www.youtube.com/watch?v=EJoGJCL12BA&feature=related>

Submissions for Lesson Two

**Lesson Three:** (Approximate Time 60 minutes)

Sifting through Research Summaries

Research summaries on Animal Behavior from Science Daily

*Aggression boldness gene in zebra fishes*

<http://www.sciencedaily.com/releases/2011/10/111006084242.htm>

*Bees, Genes Regulation in the Brain and Behaviors*

<http://www.sciencedaily.com/releases/2011/09/110926151733.htm>

*Chick (child) abuse in birds*

<http://www.sciencedaily.com/releases/2011/10/111003132454.htm>

Locate your own research summary in Science Daily

Upload lesson three, your research summary

**Lesson Four:** (Approximate Time 2 hours)

Time for Pill Bugs

Introduction Video to Pill Bugs

<http://www.youtube.com/watch?v=DWW8Caur8Co>

Read up! Pill Bugs

<http://www3.northern.edu/natsource/INVERT1/Pillbu1.htm>

<http://www.zoo.org/page.aspx?pid=511>

Review Pill Bug Primary Research Papers/Abstracts

*Turn Alternation in the Pill Bug*

<http://www.sciencedirect.com/science/article/pii/S000334726680012X>

*Problem solving and autonomous behaviors in pill bugs*

[http://www.tandfonline.com/doi/abs/10.1207/s15326969eco1604\\_2](http://www.tandfonline.com/doi/abs/10.1207/s15326969eco1604_2)

*Animal Cognition The Ability to Express Multiple-Choice Behavior in Pill Bugs*

<http://sciencelinks.jp/j-east/article/200520/000020052005A0787414.php>

*Thermal Physiology*

[http://www.bio.puc.cl/caseb/pdf/prog1/temperatura\\_eer.pdf](http://www.bio.puc.cl/caseb/pdf/prog1/temperatura_eer.pdf)

*Turn Alternation*

<http://www.sciencedirect.com/science/article/pii/0003347267900139>

Upload Pill Bug document

Safety and Permission Forms

Pill Bug Experimental Design

Forming the PB Explore Teams (group of four)

**Lesson Five:** *(Approximate Time Plan at least 2 weeks setting aside 30 minutes to 3 hours a day)*

The Pill Bug Experiment, Abstract and Poster

The Pill Bug Student-Designed Experiment

The Pill Bug Abstract

Upload the FINAL Abstract for the PB Explore Team

The Pill Bug Poster

<http://www.youtube.com/watch?v=MqgjgwIXadA&feature=fvwrel>

Final Poster Submission for the PB Explore Team