

# “Write to Learn” Activities – Sciences

## In-class Writing (Five Common Activities)

### 1. Free Writes

To activate prior knowledge or generate ideas by free association.

Students write about a predetermined topic for a brief, specified number of minutes (1-5 minutes) as fast as they can and put words on paper.

#### When to use it

- ✓ Works as a good warm-up at the beginning of class. Instructors can pose an opening/introduction question related to the day’s topic.

For example:

- What do you know about X?
- In your opinion, should scientists feed polar bears to save them from extinction? Take 3 minutes to write out your ideas. Then read and share your ideas with a partner.

- ✓ Can be used for introductions to lab work.

For example:

- Write down what you recall in the lab manual, what is to be done in lab today, any procedures that confuse you, and the purpose of the experiment.

- ✓ Can be used to wrap up the day’s topic or lecture or to help connect ideas.

For example:

- What did you learn today about X?
- What questions are left unanswered with regards to X?
- What did you learn today about the potential applications of the laws of thermodynamics?
- What questions are left unanswered in regards to the kinds of tissue in the human body?
- What part of this concept/these concepts confuse(s) you?
- Explain what we learned today in your own words.
- What is the relationship between last day’s topic and today’s?

- ✓ Can be used to supplement reading content.

For example:

- What questions do you have about the last reading?
- What were the most important points in the last reading?

### 2. Paragraph Writing

Students write, read, and share their paragraphs.

Can be used to:

- ✓ Define a concept you’ve presented.

- ✓ Apply a principle to the students' experience.
- ✓ Make connections with previous learning.
- ✓ Summarize or synthesis important points from a lecture or assigned reading.
- ✓ Translate a principle into a word problem.

Sample Paragraph Writing Prompt Based on Assigned Reading:

- A. Read or skim the abstract, introduction (p. 1-2), and conclusion (p. 9-10) sections for the Molnar, Derocher, Thiemann, and Lewis (2010) article.
- B. In a free writing paragraph, answer:  
 "What do Molnar, Derocher, Thiemann, and Lewis (2010) suggest is absolutely necessary for the survival, reproduction, and abundance of polar bears? Take 5 minutes to write your paragraph. Then read and share your paragraph with your group."

### **3. One-Sentence Summaries**

Have students write one-sentence summaries of a lecture, lab assignment, reading assignment, or discussion.

#### **Sample Topic:**

"Using the same text source for our last topic on 'Paragraph Writing', write a 1-sentence summary of the reading assignment. Then share your ideas with someone from another discipline (outside of your area of Social Sciences, Humanities, or Science)."

### **4. Writing Questions**

Have students write 2 or 3 questions concerning the main ideas or concepts in a reading.

#### **Topic Prompt:**

"Using the same text as above, jot down 2 or 3 questions you have concerning the main ideas or concepts in the reading. Then share your ideas with another person from another discipline (outside of your area of Social Sciences, Humanities, or Science)."

### **5. The One-Minute Paper**

Students summarize the most important or most useful point(s) from the lecture, lab, reading assignment, or discussion; Students can write questions that remain as well. Instructors can modify topics.

#### **Sample One-Minute Writing Prompt from Today's Presentation:**

"What are the basic ideas behind the concept 'Writing Across the Curriculum' (WAC) that we learned today?"

### **Other in-class writing activities**

#### **Exam Prep**

##### *Mock Test Creation*

Use class time for students to brainstorm and review idea before exams.

### *Anonymous Question Box*

Make a question box for students to place things they would find useful to review before an exam. This could also be done by anonymous submissions of sheets of paper in class or online.

## **Writing**

### *“First Day” Writing Activities*

Some ideas for short writing prompts:

1. Give students a general question to introduce them to the general material on the first day.
2. Ask them to write a short response to submit to you; you can return it to the students at the end-of-term as a reflective exercise.
3. Toss out a “playground” question for them to answer in groups, or for you to put answers on the board. Ease them into contributing with a friendly assignment.
4. Have students jot down any fears or anxieties they have as they enter your course.

### *Short Answer Writing*

The instructor poses a question. Students write and share answers with partners or the class.

### *Problem Solving*

Ask students to write out a practical problem that the concept, experiment introduced, etc. might help to solve.

### *Alternative Views*

Have students write alternative points of view to a different topic relative to your course.

Example: What are the causes of soil erosion according to X, Y, and Z?

## **Visual**

### *Visual Representation*

Instructors can lead brainstorming of main themes through visual representations or drawing.

Example: Take a minute to draw some pictures of the first few things that come to mind when you think of climate change.

## **Group Work**

### *Snowballing*

This involves expanding groups. Students prepare a question or response alone. Then they join a partner, pair, etc. to compare and discuss.

### *Buzz Groups*

Students work as a group to write down important things prior to doing a lab experiment. To diversify, students can write on note paper, poster board, etc.

### *How-to Lab Report*

Students write step-by-step instructions for different experiments. Groups follow each other's instructions and the writers observe. Then the original students rewrite their instructions for any points of clarification.

## **Note-taking**

### *Class Minutes*

Have 1 or 2 students be notetakers for the day who will be responsible for summarizing the class presentation, lecture, or lab activities in the first 5 minutes of the next class.

### *Field Research Observation Reports*

Students take notes on whatever they choose to observe.

## **Scenarios**

### *Problem Generating*

For math or physics: Take a formula or theorem and create a scenario or problem that would require using the formula.

### *Creative Micro-Theme Assignment*

This example comes from p. 14-15 of the Hedengren (2004) TA textbook. It is an example of a creative activity, which can help students to understand the physical states or phases of matter and intermolecular forces (especially of hydrogen bonding).

Scenario: You are a single water molecule among many in a hot water heater. All of a sudden, you are released from the water heater tank and violently expelled through the nozzle of a showerhead. Before you recover, however, you are alone for a period of time, until you meet a group of your water molecule friends on the surface of the bathroom mirror.

Writing Assignment: On the surface of the mirror, you and your friends all share similar stories. Since you are the most scientifically inclined of the group, you are assigned to write a short report, based on sound fundamental molecular reasoning explaining what happened to you all. Your report to the group should include a discussion of the forces that kept you all together and reunited you. You should also explain why you each found yourselves alone for a period of time and how you ended up together again on the surface of the mirror. A couple of good paragraphs should suffice.

## **Other**

### *Rotating Response Stations*

This helps to introduce a physical element or dynamism for a specific topic of concept.

### *Assignment Idea Generation*

Use class time to students to brainstorm and generate ideas for a class assignment.

## **Out-of-Class Writing Activities**

### **Based on Course Concepts**

#### *Compact Essays*

Have students write a 2 or 3 page essay on a key course concept or topic. It's good to assign different groups different topics. Then they have to condense their own essay to 1 page and share it with classmates. The other students read and comment on it. Finally, they can write a group paper that combines the best of their ideas in 1 page.

#### *Record Challenges*

Students can jot down notes concerning where they are stuck or confused about certain points.

### **Based on Readings**

#### *Free Writes as Homework*

Students can write about what they read and what they don't understand; this can include notes and reflection; Instructors can change prompts.

#### *Response Papers*

Students can respond to particular features of a reading (the quality of data, the focus of the research reported, the validity of the research design, the effectiveness of logical argument).

#### *Abstract Paragraph Summaries of Readings*

Students can practice writing abstract-style paragraphs for chapters or readings as a summary of the main points.

#### *Short Synthesis Papers*

Students can work through commonalities across several readings in their writing.

#### *Exploratory Writing Assignments*

Ask students to compare two concepts from a reading, connect a concept from the reading to some experience in their lives, or work out a definition in writing.

#### *Annotation Paragraph of Readings*

Students can practice writing annotation paragraphs that include key ideas, strengths, and weaknesses geared toward a particular class project or assignment.

#### *Journals*

This can include logs based on reading (combined with SQRRRW – Survey, Question, Read, Recite, Review, Write skills/SPAR skills), writing logs, lecture logs, or thinking logs; journals can be ongoing; prompts can remain constant or vary.

### **Assignments/Presentations**

#### *Paper or Lab Report Presentation*

Students bring condensed 1-page versions of papers or lab reports and present to groups or the whole class.

### *Writer's Log Submissions*

Have students submit a writer's log for submission of assignment drafts. Ask the students about their main point, how the writing went, which parts seem strong, weak, what questions they have for their readers, etc. This works like a reflection when students submit a draft assignment.

### *Annotation Paragraph of Readings*

Students can practice writing annotation paragraphs that include key ideas, strengths, and weaknesses geared toward a particular class project or assignment.

## **Other**

### *Famous Scientist Question Period*

Students can generate a list of questions they would pose to a famous scientist in their field.

### *Collaborative Team Reports or Writing*

Students join together for collaborative writing.

### *Journals*

This can include logs based on reading (combined with SQRRRW – Survey, Question, Read, Recite, Review, Write skills/SPAR skills), writing logs, lecture logs, or thinking logs; journals can be ongoing; prompts can remain constant or vary.

## **Online Write-to-Learn Options**

Many of the activities can be tailored to online formats:

### *e-journals, Course Websites, or emails*

Students can respond to certain topics or prompts in these forums and instructors can highlight interesting or relevant posts.

### *Discussion Boards*

Students can post provocative questions, queries, or summary/analysis of labs or lectures on an electronic bulletin board or Web forum for class comment.

### *Puzzlemaker*

This is a fun tool for students or instructors to create crosswords, word searches, etc. for key concepts and ideas.

Link: <http://www.discoveryeducation.com/free-puzzlemaker/?CFID=3208214&CFTOKEN=18370909>