**Appendix A: Central Texts and Links**

* “Water is Life” by Barbara Kingsolver <http://ngm.nationalgeographic.com/2010/04/water-is-life/kingsolver-text>
* Earth’s Water Cycle NASA Video <http://svs.gsfc.nasa.gov/vis/a010000/a011000/a011054/index.html> (video and transcript)
* The Earth as a System: Earth’s Spheres, Gallaudet University, (Slides 3-7): [sci.gallaudet.edu/MSSDScience/ESSSpheres.ppt](file:///C:\Users\SAP\Downloads\sci.gallaudet.edu\MSSDScience\ESSSpheres.ppt)
* Relationship between the atmosphere, hydrosphere, lithosphere, and biosphere diagram: <http://www.britannica.com/EBchecked/media/112176>
* How Water Availability may change, as temperatures, population, and industrialization increase, 1961 – 1990. BBC News, December 2009: <http://news.bbc.co.uk/2/hi/science/nature/7821082.stm>
* Desertification Curriculum from United Nations Education, Scientific, and Cultural Organization: <http://www.unesco.org/mab/doc/ekocd/index_case.html>
* Climate and Water: In the Air and on Land, National Center for Atmospheric Research: <https://spark.ucar.edu/longcontent/climate-and-water-air-and-land>
* Blue Marble Globe Images and Animation Files, NASA: <http://visibleearth.nasa.gov/view.php?id=57723>
* Tropical Rainfall Measuring Mission – Middle School Overview. NASA: <http://trmm.gsfc.nasa.gov/overview_dir/why-ms.html>
* Water Cycle Model. United States Geologic Survey (USGS). <http://ga.water.usgs.gov/edu/watercycle.html>
* Water Cycle Model. Center for Atmospheric Research. <https://www2.ucar.edu/atmosnews/people/aiguo-dai>
* Water Cycle Model. Encyclopedia Britannica. <http://www.britannica.com/EBchecked/topic/278858/hydrologic-cycle>
* Water Cycle Model. U.S. Environmental Protection Agency.

<http://www.epa.gov/climatechange/images/impacts-adaptation/WaterCycleChanges.jpg>

* Water Cycle Model. BBC Education Scotland. <http://www.bbc.co.uk/scotland/education/int/geog/rivers/hydrological.shtml>
* Why Care About Water. National Geographic: <http://video.nationalgeographic.com/video/environment/freshwater/env-freshwater-whycare/>

**Appendix B: Handouts and Recording Forms**

**Lesson 1 - Writing Prompt**

Name:

Date:

How do humans impact the fresh water resources of our planet? Barbara Kingsolver wrote, “Water is Life.” Using what you have learned about water on Earth write an informational essay that explains the relationship between the hydrosphere and watersheds and how humans impact our fresh water resources. Give your conclusions or claims about the need to protect fresh water resources. Use at least one conceptual model not previously used in class and three quotes from texts that we have studied to support your claims or clarify your ideas. Include a reference list with your essay.

**Lesson 1 - Model for Explanatory Essay**

Name:

Date:

*Writing Prompt:*

How do humans impact the fresh water resources of our planet?

Barbara Kingsolver wrote, “Water is Life.” Using what you have learned about water on Earth write an informational essay that explains the relationship between the hydrosphere and watersheds and how humans impact our fresh water resources. Give your conclusions or claims about the need to protect fresh water resources. Use at least one conceptual model not previously used in class and three quotes from texts that we have studied to support your claims or clarify your ideas. Include a reference list with your essay.

**Water: A Precious Resource**

Water is one of the most important and most common natural resources. We all have experience with water through the seasons as rain, hail, snow, ice, steam, fog, or dew; or through the faucet as dish water, pool water, or when we take a shower. The increasing demand for this limited resource, the changes that humans have made to the surface of the earth, and the rising temperature across the globe have altered where, when, and how much water is available to support life. According to Barbara Kingsolver, “The past decade has brought us more extreme storms than ever before, of the kind that dump many inches in a day, laying down crops and utility poles and great sodden oaks whose roots cannot find purchase in the saturated ground (Kingsolver, 2010).” What is happening? How can understanding the hydrological cycle help us understand these dramatic weather events?



Figure 1: Water Cycle (Ohio Department of Natural Resources, 2011)

Hydrologists, scientists who study water, understand that water is our most precious resource. The amount of water on Earth has never changed. We continually recycle and reuse only 1% (National Geographic) of the water on the earth. The hydrologic cycle (Figure 1) explains the movement of water between the atmosphere (air), ground (lithosphere) and the biosphere (life zone). All of life depends on this small percentage of the Earth’s water.

“Water is the visible face of climate and, therefore, climate change. Shifting rain patterns flood some regions and dry up others as nature demonstrates a grave physics lesson: Hot air holds more water molecules than cold (Kingsolver, 2010).” Data collected by satellites and sensors around the planet help us to understand that the surface temperatures of the oceans, the wind, and air temperatures determine how much water evaporates from the ocean. Increased precipitation and flooding in some areas and droughts in other areas are a result of these dynamics.

In addition to the increases in air and sea temperatures, land use patterns by humans are also changing the availability of water. Irrigated agriculture uses almost 70% of the fresh water resources (National Geographic). This water is drawn from rivers, streams, and underground aquifers. In more arid parts of the world, like the Piura Valley of Peru, when too much water is pumped from underground sources and diverted from streams to support irrigation, the wells run dry and there is no water for humans or other plants and animals to survive. This process of desertification is increasing in many parts of the world. “Forty percent of the households in sub-Saharan Africa are more than a half hour from the nearest water, and that distance is growing. in sub-Saharan Africa are more than a half hour from the nearest water, and that distance is growing (Kingsolver, 2010).

As we increase our understanding of the importance, limitations and power of the freshwater moving through the hydrologic cycle, it is vital that we change the way we think about water. We must learn to live within the boundaries of the 1% that is available to us. Reversing the course of rising sea temperatures and desertification will be important tasks for my generation. Understanding the hydrologic cycle is the first step our a journey to use evidence and science to protect this precious resource for the coming generations.

Kingsolver, Barbara . Water is Life. National Geographic Magazine. April 2010.

National Geographic. *Freshwater: Why care about water?* <http://video.nationalgeographic.com/video/environment/freshwater/env-freshwater-whycare/>. June 5, 2013.

Ohio Department of Natural Resources. Fact Sheet 93–18.<http://www.dnr.state.oh.us/tabid/4101/default.aspx>. June 5, 2013.

Lesson 1 - Teaching Task Rubric (Informational or Explanatory)[[1]](#footnote-1)

|  |  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| Scoring Elements | Not Yet | | Approaches Expectations | | | Meets Expectations | | | Advanced | |
| 1 | 1.5 | | 2 | 2.5 | | 3 | 3.5 | | 4 |
| Focus | Attempts to address prompt, but lacks focus or is off-task. |  | | Addresses prompt appropriately, but with a weak or uneven focus. |  | | Address prompt appropriately and maintains a clear, steady focus. |  | | Addresses all aspects of prompt appropriately and maintains a strongly developed focus. |
| Thesis – Main Idea | Attempts to establish a thesis, but lacks a clear purpose. |  | | Establishes a thesis with a general purpose. |  | | Establishes a thesis with a clear purpose maintained throughout the response. |  | | Establishes a strong thesis with a clear purpose maintained throughout the response. |
| Reading/ Research | Attempts to present information in response to the prompt, but lacks connections or relevance to the purpose of the prompt. Does not address the credibility of sources as prompted. |  | | Presents information from reading materials relevant to the purpose of the prompt with minor lapses in accuracy or completeness. Begins to address the credibility of sources when prompted. |  | | Presents information from reading materials relevant to the prompt with accuracy and sufficient detail. Addresses the credibility of sources when prompted. |  | |  |
| Development | Attempts to provide details in response to the prompt, including retelling, but lacks sufficient development or relevancy. Implication is missing, irrelevant, or illogical. Gap/unanswered question is missing or irrelevant. |  | | Presents appropriate details to support the thesis. Briefly notes a relevant implication or a relevant gap/unanswered question. |  | | Presents appropriate and sufficient details to support the thesis. Explains relevant and plausible implications, and a relevant gap/unanswered question. |  | | Presents thorough and detailed information to strongly support the thesis. Thoroughly discusses relevant and salient implications or consequences, and one or more significant gaps/unanswered questions. |
| Organization | Attempts to organize ideas, but lacks control of structure. |  | | Uses an appropriate organizational structure to address the specific requirements of the prompt, with some lapses in coherence or awkward use of the organizational structure |  | | Maintains an appropriate organizational structure to address the specific requirements of the prompt. |  | | Maintains an organizational structure that intentionally and effectively enhances the presentation of information as required by the specific prompt. |
| Conventions | Attempts to demonstrate standard English conventions, but lacks cohesion and control of grammar, usage, and mechanics. Sources are used without citation. |  | | Demonstrates an uneven command of standard English conventions and cohesion. Uses language and tone with some inaccurate, inappropriate, or uneven features. Inconsistently cites sources. |  | | Demonstrates a command of standard English conventions and cohesion, with few errors. Response includes language and tone appropriate to the audience, purpose, and specific requirements of the prompt. Cites sources using an appropriate format with only minor errors. |  | | Demonstrates and maintains a well-developed command of standard English conventions and cohesion, with few errors. Response includes language and tone consistently appropriate to the audience, purpose, and specific requirements of the prompt. Consistently cites sources using an appropriate format. |
| Content Understanding | Attempts to include disciplinary content in explanations, but understanding of content is weak; content is irrelevant, inappropriate, or inaccurate. |  | | Briefly notes disciplinary content relevant to the prompt; shows basic or uneven understanding of content; minor errors in explanation. |  | | Accurately presents disciplinary content relevant to the prompt with sufficient explanations that demonstrate understanding. |  | | Integrates relevant and accurate disciplinary content with thorough explanations that demonstrate in-depth understanding. |

Lesson 1 - Teaching Task Rubric - Writer’s Glossary

Name:

Date:

Accuracy - Exactness

Accurately - Correctly

Appropriately - Correctly

Attempts - Tries

Briefly - For a short time

Cites - reference

Cohesion - sticking together.

Completeness - Entirely

Consequences - Effects

Content Understanding – Knowledge about the subject

Conventions – Rules and agreements

Credibility - Trustworthiness

Demonstrates - Shows

Disciplinary content – subject content

Effective - feasible

Focus - Emphasis

Gap - Hole

Grammar, usage, and mechanics – conventions and rules of the English language

Illogical - Inconsistent

Implications - Suggestions

Inaccurate - wrong

Inappropriate - incorrect

Inconsistently - Inconsistently

In-depth understanding - thorough knowledge

Integrates - Mixes

Irrelevant - inappropriate

Lapses - Gaps

Notes - Sum-ups

Organizational structure – how the essay is arranged and ordered

Plausible - Likely

Purpose - Determination

Relevance - Importance

Salient - Important

Standard English – the language of the US

Sufficient - Enough

Thesis - Idea

Thorough - comprehensive

Tone - attitude

Uneven command of standard English - uneven command of the language of the US

Uneven features - irregular

Well-developed - strong

**Lesson 2 - Graphic Organizer for Thesis Statement**

Name:

Date:

|  |
| --- |
| **It is important to start your essay with clear direction. This Graphic Organizer will help you to formulate your thesis statement.**  **A thesis statement:**   1. **Describes your topic, what your essay will be about.** 2. **Introduces a specific claim you are making about  your topic.** 3. **Describes three ways in which you will support and develop your claim.** |
|  |
| **TOPIC: What is the Prompt asking you to write about?**  My essay will be about:    But there is a lot to say on this subject, so I have to narrow it down to one specific claim. |
| **SPECIFIC CLAIM ABOUT YOUR TOPIC**  My claim is: |
| **Three pieces of evidence I will use to support my claim:** |
|  |
|  |
|  |
| **My Thesis Statement:** |

**Lesson 2 - Graphic Organizer for Thesis Statement Using Model Essay - Teacher Reference**

Name:

Date:

|  |
| --- |
| **It is important to start your essay with clear direction. This Graphic Organizer will help you to formulate your thesis statement.**  **A thesis statement:**   1. **Describes your topic, what your essay will be about.** 2. **Introduces a specific claim you are making about  your topic.** 3. **Describes three ways in which you will support and develop your claim.** |
|  |
| **TOPIC: What is the Prompt asking you to write about?**  My essay will be about:  ***Fresh water is a precious resource that is needed for survival***  But there is a lot to say on this subject, so I have to narrow it down to one specific claim. |
| **SPECIFIC CLAIM ABOUT YOUR TOPIC**  My claim is: ***where, when, and how much water is available to support life has changed because of human actions*** |
| **Three pieces of evidence I will use to support my claim:**  **1. *increasing population means increasing demands for water***  **2. *rising temperatures due to climate change is increasing the amount of water in the atmosphere***  **3. *Agriculture and impervious surfaces have changed the surface of the earth and increase storm water runoff and reduced the ability for groundwater and aquifers to recharge.*** |
| **My Thesis Statement:**  ***The increasing demand for this limited resource, the changes that humans have made to the surface of the earth, and the rising temperature across the globe have altered where, when, and how much water is available to support life.*** |

**Lesson 3 - Units 1 and 2 Central Texts Anchor Chart**

|  |
| --- |
| * “Water is Life” by Barbara Kingsolver <http://ngm.nationalgeographic.com/2010/04/water-is-life/kingsolver-text> * Earth’s Water Cycle NASA Video <http://svs.gsfc.nasa.gov/vis/a010000/a011000/a011054/index.html> (video and transcript) * The Earth as a System: Earth’s Spheres, Gallaudet University, (Slides 3-7): [sci.gallaudet.edu/MSSDScience/ESSSpheres.ppt](file:///C:\Users\SAP\Downloads\sci.gallaudet.edu\MSSDScience\ESSSpheres.ppt) * Relationship between the atmosphere, hydrosphere, lithosphere, and biosphere diagram: <http://www.britannica.com/EBchecked/media/112176> * How Water Availability may change, as temperatures, population, and industrialization increase, 1961 – 1990. BBC News, December 2009: <http://news.bbc.co.uk/2/hi/science/nature/7821082.stm> * Desertification Curriculum from United Nations Education, Scientific, and Cultural Organization: <http://www.unesco.org/mab/doc/ekocd/index_case.html> * Climate and Water: In the Air and on Land, National Center for Atmospheric Research: <https://spark.ucar.edu/longcontent/climate-and-water-air-and-land> * Blue Marble Globe Images and Animation Files, NASA: <http://visibleearth.nasa.gov/view.php?id=57723> * Tropical Rainfall Measuring Mission – Middle School Overview. NASA: <http://trmm.gsfc.nasa.gov/overview_dir/why-ms.html> * Water Cycle Model. United States Geologic Survey (USGS). <http://ga.water.usgs.gov/edu/watercycle.html> * Water Cycle Model. Center for Atmospheric Research. <https://www2.ucar.edu/atmosnews/people/aiguo-dai> * Water Cycle Model. Encyclopedia Britannica. <http://www.britannica.com/EBchecked/topic/278858/hydrologic-cycle> * Water Cycle Model. U.S. Environmental Protection Agency.   <http://www.epa.gov/climatechange/images/impacts-adaptation/WaterCycleChanges.jpg>   * Water Cycle Model. BBC Education Scotland. <http://www.bbc.co.uk/scotland/education/int/geog/rivers/hydrological.shtml> * Why Care About Water. National Geographic: <http://video.nationalgeographic.com/video/environment/freshwater/env-freshwater-whycare/> |

**Lesson 3: Graphic Organizer for Details**

Name:

Date:

Focus Question: Your Thesis:

|  |  |  |
| --- | --- | --- |
| DETAIL/EXAMPLE 1 | DETAIL/EXAMPLE 2 | DETAIL/EXAMPLE 3 |
| QUOTE:  CITATION: | QUOTE:  CITATION: | QUOTE:  CITATION: |
| EXPLAIN HOW THE QUOTE SUPPORTS YOUR THESIS: | EXPLAIN HOW THE QUOTE SUPPORTS YOUR THESIS: | EXPLAIN HOW THE QUOTE SUPPORTS YOUR THESIS: |

**Lesson 3 - Using and Citing Illustrations in Essays**

Name:

Date:

**What images should I use?**

All images, photos, conceptual models, diagrams, graphs, etc. should be directly relevant to your thesis. Don’t just insert pretty pictures for the sake of it. Select images that will:

* Help your readers understand your point.
* Illustrate your ideas.
* Provide examples and evidence

Make direct references to your images in your essay. A few ways to do this:

* “An example of this style can be seen in Figure 1.”
* “This style was very ornate. (See example Figure 1)”
* “Many chairs of this era, particularly the chairs at Versailles (Figure 1), were very ornate.”

There are two ways to organize your images: either place them in your text next to the paragraph where you discuss them (Figure 1), or put them all together at the end of the essay (Figure 2).

Illustrations

Figure 1: Figure in text. Figure 2: Figures at end of essay

Diagram by Author Diagram by Author

**Captions**

Images always need captions. A caption is a title and short explanation, or description accompanying an illustration or a photograph. Captions should do two things: label the image and tell us the image’s source. To label the image you can simply say,

Figure 1: (www.EPA.gov)

Figure 1: The Earth’s Water Cycle (www.NASA.com)(

**Citation**

Images that you use in your essay have to be cited; make sure the source is listed in your Bibliography or Reference List.

**Lesson 3: Graphic Organizer for Model**

Name:

Date:

Focus Question: Your Thesis:

Title of Your Model:

|  |  |  |
| --- | --- | --- |
| DETAIL 1 | DETAIL 2 | DETAIL 3 |
| SCIENTIFIC VOCABULARY: | SCIENTIFIC VOCABULARY: | SCIENTIFIC VOCABULARY: |
| EXPLAIN HOW THE DETAIL CLARIFIES THE MODEL. | EXPLAIN HOW THE DETAIL CLARIFIES THE MODEL. | EXPLAIN HOW THE DETAIL CLARIFIES THE MODEL. |
| EXPLANATION OF HOW YOUR MODEL SUPPORTS YOUR THESIS: | | |
| CITATION FOR YOUR MODEL | | |

**Lesson 4 - Planning the Essay Template**

Name:

Date:

**Introductory Paragraph**

* Introduces your topic and provides necessary background information about water on Earth
* Captures the reader’s interest and attention
* States your claim/thesis clearly

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**Thesis: \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_**

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**Body Paragraphs**

* Each Topic Sentence develops one of the pieces of evidence you have selected to support your claim.
* A., B., etc., are details that support the evidence
* 1., 2, etc., explain and connect your details to your claim/thesis

**Body Paragraph I (Topic Sentence): \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_**

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**2. \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_**

**B. \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_**

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**Body Paragraph II (Topic Sentence): \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_**

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**Body Paragraph III (Topic Sentence): \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_**

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**Concluding Paragraph**

* Restates the claim/thesis in different words (does not make a brand- new point).
* “Wraps up” the paper. (states a lesson, gives advice or a final insight, offers a solution, tells the results, etc.)

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**Appendix C: Protocols[[2]](#footnote-2)**

* Checking for Understanding
* Gallery Walk
* Peer Critique
* Word Wall



**Checking for Understanding: Key Assessment for Learning Techniques**

When we check *all students'* levels of understanding throughout each lesson, it sets the tone that everyone's thinking is important and necessary, and we forward the learning and engagement of all. Some techniques are too time-consuming to use as quick pulse checks, but using these key techniques together *in all lessons* allows us to track learning and adapt instruction appropriately on the spot.

**In all lessons, teachers should:**

**Ground the lesson in the learning target.** This means they:

* Post the target in a visible, consistent location
* Discuss the target at the beginning of class with students, having students put the target into their own words, explain its meaning, and explain what meeting the target might look like
* Reference the target throughout the lesson
* Return explicitly to the target during the debrief, checking for student progress

**Use Cold Call.** This means they:

* Name the question before identifying students to answer it
* Call on students regardless of whether they have hands raised, using a variety of techniques such as random calls, tracking charts to ensure all students contribute, name sticks or name cards
* Scaffold the questions from simple to increasingly complex, probing for deeper explanations
* Connect thinking threads by returning to previous comments and connecting them to current ones. In this way, listening to peers is valued, and even after a student's been called on, s/he is part of the continued conversation and class thinking

**Use No Opt Out.** This means they:

* Require all students to correctly answer questions posed to them
* Always follow incorrect or partial answers from students by giving the correct answer themselves, cold calling other students, taking a correct answer from students with hands raised, cold calling other students until the right answer is given, and then returning to any student who gave an incorrect or partial answer for complete and correct responses

**Use guided practice** before releasing students to independent application. This means they:

* Ask students to quickly try the task at hand in pairs or in a low-stakes environment
* Strategically circulate, monitoring students' readiness for the task and noting students who may need re-teaching or would benefit from an extension or more challenging independent application
* Use an appropriate quick-check strategy (see below in Tools/Protocols section) to determine differentiation or effective support during independent application time

**End with an effective debrief.** This means they:

* Return explicitly to the learning targets (both academic and character/habits of work)
* Elicit student reflection towards the learning target(s), probing for students to provide evidence for their own and/or class progress
* Celebrate or have students celebrate individual, small group or whole class successes
* Identify or have students identify goals for improvement around the target(s)

**Quick-Check Tools and Protocols**

The following tools and protocols promote engagement by checking for all students' understanding and by reflecting on and emphasizing effective work habits.

**Whip-Around:** When a one- or two-word answer can show understanding, self- or group assessment, or readiness for a task, teachers ask students to respond to a standard prompt one at a time, in rapid succession around the room.

**Whiteboards:** Students have small white boards at their desks or tables and write their ideas/thinking/ answers down and hold up their boards for teacher and/or peer scanning.

**Hot Seat:** The teacher places key reflection or probing questions on random seats throughout the room. When prompted, students check their seats and answer the questions. Students who do not have a hot seat question are asked to agree or disagree with the response and explain their thinking.

**Fist-to-Five or Thumb-Ometer:** To show degree of agreement, readiness for tasks, or comfort with a learning target/concept, students can quickly show their thinking by putting their thumbs up, to the side or down; or by holding up (or placing a hand near the opposite shoulder) a fist for 0/Disagree or 1-5 fingers for higher levels of confidence or agreement.

**Glass, Bugs, Mud:** After students try a task or review a learning target or assignment, they identify their understanding or readiness for application using the windshield metaphor for clear vision. Glass: totally clear; bugs: a little fuzzy; mud: I can barely see.

**Red Light, Green Light**: Students have red, yellow and green objects accessible (e.g. popsicle sticks, poker chips, cards), and when prompted to reflect on a learning target or readiness for a task, they place the color on their desk that describes their comfort level or readiness (red: stuck or not ready; yellow: need support soon; green: ready to start). Teachers target their support for the reds first, then move to yellows and greens. Students change their colors as needed to describe their status.

**Table Tags:** Place paper signs/table tents in three areas with colors, symbols or descriptors that indicate possible student levels of understanding or readiness for a task or target. Students sit in the area that best describes them, moving to a new area when relevant.

**Sticky Bars:** Create a chart that describes levels of understanding, progress or mastery. Have students write their names or use an identifying symbol on a sticky note and place their notes on the appropriate place on the chart.

L**earning Line-ups:** Identify one end of the room with a descriptor such as "Novice" or "Beginning" and the other end as "Expert" or "Exemplary". Students place themselves on this continuum based on where they are with a task or learning target. Invite them to explain their thinking to the whole class or the people near them.

**Human Bar Graph:** Identify a range of levels of understanding or mastery (e.g. beginning/developing/ accomplished or Confused/I'm okay /I am rocking!) as labels for 3-4 adjacent lines. Students then form form a human bar graph by standing in the line that best represents their current level of understanding.

**Admit and Exit Slips:** Any relevant questions, prompts, or graphic displays of student thinking can be captured on a small sheet of paper and scanned by the teacher or other students to determine a student's readiness for the next step or assess learning from a lesson. Teachers may use admit slips as a "ticket to enter" a discussion, protocol or activity. These may also be used as "tickets to leave."

**Presentation Quizzes:** Whenever peers present, other students may think they are not responsible for the information. Pair student presentations and sharing with short quizzes at the end of class.

**Catch and Release/7:2**: When students are working on their own, they often need clarification or pointers so that they do not struggle for too long of a period or lose focus. A useful ratio of work time to checks for understanding or clarifying information is 7 minutes of work time (release), followed by 2 minutes of teacher-directed clarifications or use of one of the quick-check strategies (catch).

**Gallery Walk Protocol**

Purpose:

Use this Gallery Walk protocol to create a process for students to learn about and respond to several articles on a topic, or several examples of text on a certain topic. This protocol allows students to move around the room in order to view a variety of texts and to engage in small-group collaboration.

Procedure:

1. Divide students into small groups of 3-4 (or pairs).
2. Assign each group an article/piece of text to read.
3. After each group reads its article/text, have group members discuss the article then write main ideas and questions from the article on chart paper.
4. Have the groups post their chart paper on the wall with a chart paper next to it.
5. Ask groups to rotate around the room reading the main ideas and key details from each text. Have students write responses on post-its as they read each chart paper and stick the post-its to the blank sheets of chart paper next to the ones on the articles.
6. After everyone has responded to each of the articles, have the groups to their original chart paper and read and discuss the post-its left by other.
7. Assign each group a specific segment of your topic (example: legislative branch of government, role of a worker bee, or transportation on the river).
8. Provide each group with additional materials they need to further enhance the study that has already been introduced, probably in a large-group setting (example: Government, Insects, Importance of our River).
9. Allow time for group to read and discuss the new information. Using prior knowledge along with the new knowledge, have them create a visual representation that each person in the group will use to teach others in the class.
10. Be clear that each person has to understand the text and images on the poster in order to present the information effectively. Allow time for the groups to help one another focus on key components.
11. Post the work around the room or in the hallway.
12. Regroup participants so each new group has at least one member from the previously established groups.
13. Give specific directions at which poster each group will start and what the rotation will look like.
14. The speaker at each poster is the person(s) who participated in the creation of the poster.
15. When all groups have visited each poster, debrief.

Debrief:

What was your biggest “a-ha” during the tour?

How was your learning enhanced by this method?

What role did collaboration play in your success?

Why was the individual responsibility component so important?

Peer Critique Protocol

Non-Negotiables

1. Be Kind: Always treat others with dignity and respect. This means we never use words that are hurtful, including sarcasm.
2. **Be Specific:**Focus on particular strengths and weaknesses, rather than making general comments like “It’s good” or “I like it.” Provide insight into why it is good or what, specifically, you like about it.
3. **Be Helpful:** The goal is to positively contribute to the individual or the group, not to simply be heard. Echoing the thoughts of others or cleverly pointing out details that are irrelevant wastes time.
4. **Participate:** Peer critique is a process to support each other, and your feedback is valued!

Guidelines

1. Have the author/designer explain his/her work and explain exactly what type of critique would be helpful (in other words, what questions does s/he have or what is s/he confused about that s/he would appreciate help with).
2. The critique audience should begin comments by focusing on something positive about the work (“warm” feedback), then move on to constructive sharing of issues or suggestions (“cool” feedback).
3. When critiquing a peer’s work, use “I” statements. For example, “I’m confused by this part,” rather than “This part makes no sense.” Remember the three important phrases:

* “I notice….”
* “I wonder….”
* “If this were my work, I would….”

1. Use questions whenever possible. For example, “I’m curious why you chose to begin with…?”, or “Did you consider adding…?”

**Word Wall Protocol**

**Purposes:**

* To provide students with an opportunity to demonstrate their understanding of a related set of terms.
* To establish visual models that enhance understanding of a set of terms.

**Steps:**

1. Using note cards or sheets of paper, write one term or picture per card. Limit the number of cards to around 10, fewer for younger children.
2. Also make cards with one-way and two-way arrows.
3. Use the floor or magnets and a magnetic board to display the cards. Make sure the terms on the cards are known.
4. Ask a student or a pair of students to arrange the cards in a way that connects them or makes a model of the terms. Ask the student to explain what they are doing as they go along. Observers may ask questions once the model is created
5. Repeat with another student of pair
6. Keep the cards available for use as long as the terms/topic are part of the instruction

**Possible debrief questions:**

1. How did working with the cards help you understand the topic?
2. Was your thinking similar/different from the student doing the arranging?
3. Are there words you would add/subtract from the word wall?

**Modification:**

* Give each student his or her own set of word cards

1. Adapted from <http://www.literacydesigncollaborative.org/wp-content/uploads/2012/07/Educurious-Draft-LDC-Science-Templates-June15-final-1.pdf> [↑](#footnote-ref-1)
2. The following protocols were adopted from Expeditionary Learning: elschools.org [↑](#footnote-ref-2)