**QFT-Primary Source Lesson Plan Template**\*

*\*Feel free to edit, adapt, or amend this template as is most helpful to you*.

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| **LESSON OVERVIEW** | | | |
| **Name: Ann Burke** | **Grade: 6th Grade** | **Subject: Science** | **Location: Gallup Middle School** |
| **Context & Purpose:**  *Share your content/topic and/or teaching and learning objectives for this lesson and where (beginning, middle, end) in the unit or learning cycle this lesson falls.*  At the beginning of the school year, I introduce my 6th grade students to the study of science. This includes the basic process skills of classifying, observing, model making, communicating, differentiation between fact and opinion, and measuring.  Using primary source materials, the objectives for this lesson include an introduction to the use of models in the study of science. Students will experience how models are constructed from observations, how models are used to enhance understanding of the “how” and the “why” of system processes, and how models improve communication and collaboration amongst scientists. This lesson falls towards the end of this introductory unit to science. | | | |
| **Lesson Procedure:** *Share the sequence of learning activities before, during, and after the QFT*  **Learning activities before the QFT:**  1. Classification: I introduce classification using the three main branches of science (Earth, Life, and Physical) and the classification of animals into kingdoms.  2. Fact vs. opinion: Reading passages and writing assignments related to differentiating between fact and opinion.  3. Observations: I introduce observations with a “See, Think, Wonder” exercise followed by practice in formulating qualitative and quantitative observations.  4. Models: To reinforce making observations, and to introduce the practice of asking questions, I will have students create a drawing of their hand. Questions related to their hands will serve as an introduction to question formulation. At this juncture, I will provide question sentence stems, teach how to differentiate open vs. closed questions, and facilitate group discussion of the merits of each question type. In the activity to follow, students will be exposed to the concept of scale through the creation of a 2D model of their classroom (taking their own measurements of the room dimensions using inches and centimeters). Afterwards, they will draw a second model of our classroom, this time illustrating how the classroom could be rearranged.  Next, to expand on the concept of models, I will give students a photograph of a house fly (*Musca domestica*) from which they will make a hand drawing.  **QFT learning activity:**  Following the above activities, I plan to give students a primary source taken from *Micrographia*; *or some Physiological Descriptions of Minute Bodies Made by Magnifying Glasses* by Robert Hooke, page 183 (illustration of a cork tree branch with cellular structure). This will serve as the QFocus and will give students exposure to all six (6) steps of the QFT.   **Learning activities after the QFT:**  As I have never conducted a QFT, I don’t possess enough experience to predict whether student questions will focus more on the general elements associated with models or on the cork tree branch and its cellular structure. However, I will intentionally select those student questions that focus on why scientists create models, how models can aid understanding, and on the elements all high quality models possess (e.g. titles, labels, symbols, diagrams, color, scale comparisons).  Lastly, I will have students compare and contrast their drawing of a house fly with Robert Hooke’s drawing of a blue fly (page 287) in *Micrographia*; *or some Physiological Descriptions of Minute Bodies Made by Magnifying Glasses.* Student comparison/contrast observations will be recorded using a graphic organizer (specifically a Venn Diagram).  After the QFT, I will move into the second unit of Q1 (atoms and states of matter) where students will construct 2D and 3D models of atoms and states of matter using materials of their choice. | | | |
| **Next Steps (i.e. how student questions will be used after the QFT):** *Share your tentative plans for using student questions to drive subsequent learning*  The majority of my students have little to no background knowledge of the topics we cover in 6th grade science, particularly during Q1, 2, and 3. (These topics include: states of matter, thermal energy, wave mechanics, and physical Earth systems — plate tectonics, continental drift, rock and water cycles, global and regional weather). Now that I have been exposed to the QFT, I plan to alter my instructional methodology. Previously, I created Power Point presentations that contained the bulk of the background information required for understanding the various phenomena we were about to study. Students would then passively take notes on this “pre-loaded” background information. I knew there must be a much more engaging approach and that some of the heavy lifting had to be shifted to the students themselves if deep learning and comprehension were to be realized. The QFT appears to be the vehicle in which I can move into the position of being the “scribe on the side,” while students take full center stage through formulation of their own questions and then being responsible for finding their own answers.   For this school year, I plan to use a QFocus to serve as the initial “phenomenon” that introduces each new topic. Student questions will be pivotal in guiding my selection of specific instructional materials. I will endeavor to incorporate student questions into each lesson. Some ideas that I think will work well for the integration of student questions in my classroom include:  1) A permanent “Wonder Wall” displaying student questions that get marked off as they are answered, and, 2) Student questions will form the basis of: student choice projects and writing assignments, class discussion prompts, pop quizzes, summative assessments, *Quizzes.com* questions, test prep, bell work (warm up), and interactive science notebook prompts.  I intend for students to accomplish the “heavy lifting” of investigating and answering their own questions through pairing and group work (3-4 students), rotation through station activities in the laboratory, conducting experiments, and gallery walks. | | | |
| **Question Focus:** *Must include at least one primary source from loc.gov. Whenever possible, please embed the image/primary source here AND include the link. Include additional text or caption only if it is part of your QFocus.*  *A picture containing text  Description automatically generated Caption*: Drawing of a woody legume (pea or bean family) by Robert Hooke, page 183 in *Micrographic*, 1665. .  **LINK:** <https://www.loc.gov/resource/rbctos.2017rosen1511/?sp=183&r=-0.75,-0.058,2.499,1.521,0> | | **Reflect on your QFocus:** *You might consider why you chose this image, alternative QFocus options, earlier QFocus drafts or process you went through to develop it, etc.*  I chose this specific image because it is a primary source that illustrates how humans observe, record, and communicate scientific knowledge. It includes several of the elements that define a good model. This example illustrates the use of titles (Schem(e) XI; and Figures 1 and 2); labels (text: a branch, a sprout, a sprig, and leaflets lettered with symbols (alphabet letters a-n), scale comparison (normal view and enhanced view using a scientific tool (microscope)), and the incorporation of fine detail (leaf arrangement, veination, cellular structure) that serves to stimulate further inquiry into leaf and cellular form and function.  To ensure that enough question “hooks” exist with this QFocus, I added the caption, “Drawing of a woody legume (pea or bean family) by Robert Hooke, page 183 in Micrographia, 1665.” (The original manuscript is in error. It is not a drawing of a cork tree (*Quercus suber)* rather it is a most likely a woody plant in the family, *Fabaceae.*  Alternative QFocus options include:  Page 44: Written description of the sounds emitted over telephone wires between Paris and Braneford (6 miles away) with accompanying diagram. [Image 44 of Notebook by Alexander Graham Bell, from April 18, 1876 to September 30, 1876 | Library of Congress (loc.gov)](https://www.loc.gov/resource/magbell.25300102/?sp=44)  Thomas Jefferson’s drawing of a macaroni machine with instructions for making pasta, ca 1787. From [Thomas Jefferson Papers (6)](https://www.loc.gov/search/?fa=partof:thomas+jefferson+papers)  Ptomelic concept of the universe showing the Earth in the center (digital file from b&w film copy neg). Page 67. [Finding Our Place in the Cosmos: From Galileo to Sagan and Beyond (351)](https://www.loc.gov/collections/finding-our-place-in-the-cosmos-with-carl-sagan/)  <https://www.loc.gov/resource/cph.3a44868/>  Copernicus’ sun-centered model of the cosmos. [Finding Our Place in the Cosmos: From Galileo to Sagan and Beyond (351)](https://www.loc.gov/collections/finding-our-place-in-the-cosmos-with-carl-sagan/)  <https://www.loc.gov/resource/rbc0001.2012gen31925/?sp=36>  In Q4, my teaching includes the various systems of the human body, germs, and viruses. To this end, I want to use primary sources related to the identification of childhood infectious diseases and examples of how the government communicated public health guidelines aimed at prevention (rubella, whooping cough, polio, diphtheria, TB, small pox, measles, mumps, tetanus, etc.).  [Swatting the Fly: Conceptualizing Problems and Solutions around the Spread of Disease | Teaching with the Library of Congress (loc.gov)](https://blogs.loc.gov/teachers/2020/05/swatting-the-fly-conceptualizing-problems-and-solutions-around-the-spread-of-disease/) | |
| **Tailoring Instructions:** *Share any adaptations or tailoring to the standard QFT process that you are planning.*   * **Categorization Instructions:**   Once my students become comfortable with the QFT and have learned how to differentiate fact from opinion, I will create a gallery walk where I have selected a range of student questions from the work completed to date. Students will categorize these questions as:  1) Closed ended questions;  2) Open-ended questions;  3) Questions that have answers that can be easily found;  4) Questions that have answers that cannot be easily found; 5) Questions for which the response is most likely an opinion; and,  6) Questions for which the answer might not exist.   * **Prioritization Instructions:**   I plan to have students choose three questions they consider most important. However, based upon my student’s inexperience with science, I will include additional instructions to help them frame their investigations. For example, I will instruct them to choose three questions that:  1) they need to answer first;  2) they need to investigate further;  3) they think a scientist studying the Earth might ask;  4) will help our entire class understand the study of \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ (insert topic).  5) that will help them solve the problem.   * **Reflection Questions:**   During Q1 and 2, I predict I will continue to focus heavily on teaching and emphasizing to students the importance of actively formulating their own questions. I hope their direct experience with the QFT will help them realize how questioning greatly enhances learning and comprehension in all academic disciplines. I will encourage student reflection on the QFT process through Exit Tickets by asking questions like:  1) What did you learn about asking questions?  2) How did you learn about \_\_\_\_\_\_\_\_\_\_\_\_ (add topic)?  3) How do you feel about asking questions?  4) What do you understand differently now about asking questions?  5) How can you use what you learned about asking questions?  Later in the year, after the students have become comfortable with the QFT, I will pose Exit Ticket questions that are more content specific. For example:  1) What did you learn about the \_\_\_\_\_\_\_\_\_\_ (topic)?  2) How did the QFT process help you think about \_\_\_\_\_\_\_ (topic)? 3) What did you learn about the informational text you just read?  4) What questions will you use to design an experiment/determine what project you will undertake?   * **Other:** | | | |

While you are not required to implement your lesson plan to complete the “Teaching Students to Ask Their Own Primary Source Questions” course, we hope that you do! If you do have a chance to implement your lesson plan prior to posting it in the TPS Teachers Network Question Formulation Technique for Primary Source Learning group [album](https://tpsteachersnetwork.org/the-question-formulation-technique-qft-for-primary-source-learning/qft-primary-source-lesson-plans-july-2021), please consider adding and sharing some of the information below in addition to your plan above:

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| **LESSON OUTCOMES** |
| **Student Questions:** |
| **Student Reflections:** |
| **TEACHER REFLECTIONS** |
| **Reflect on your lesson design and how well it achieved your objectives.** |
| **Which student questions stood out to you? Why?** |
| **Overall, what did you learn from this experience? What questions do you now have?** |