

INQUIRY PROCESS: DEFINE & BRAINSTORM

Lesson Plan

Purpose: The purpose of this lesson is to help students formulate an appropriate research topic (i.e., a Big Question) and researchable questions (i.e., Little Questions) that will guide their inquiry. They can organize and classify their Little Questions, by labeling them using the arm analogy, which will help them identify the big ideas about the topic under study. Creating their own questions will allow students to take ownership of the inquiry process.

OUTCOMES

LESSON GOALS	QEP COMPETENCIES
Students will be able to... <ul style="list-style-type: none"> Select and concisely state an appropriate research topic by writing it as a Big Question. Identify their prior knowledge about the topic. Formulate and articulate what is not known by writing researchable questions (Little Questions). Determine what does not need to be known about this topic in the context of this task. 	<p><i>Languages: English Language Arts</i></p> 2 – To write self-expressive, narrative and information-based texts 3 – To represent her/his literacy in different media 4 – To use language to communicate and learn
	<p><i>Cross Curricular</i></p> 3 – To exercise critical judgment 4 – To use creativity 5 – To adopt effective work methods 6 – To use information and communication technologies 8 – To cooperate with others 9 – To communicate appropriately

Materials:

- Overhead transparencies.
- Index cards/Cue cards (12 per group).
- Whiteboards and markers.
- Computers and Internet access (for IS-21).
- Optional: Sheets of paper with role or categories written at the top (see Hot Potato activity).*
- Optional: Timer.*
- Optional: Worksheets of the Define exercise (see the teacher resources page for the worksheet).*
- Optional: Worksheets of the Brainstorm exercise (see the teacher resources page for the worksheet).*

THE ARM ANALOGY

- 1) *Generate* a list of questions that students have asked or been asked recently. You can get the ball rolling by listing memorable questions that students have asked you since the beginning of the year. Then invite students to share some questions that they recently encountered. These questions do not have to be related to any course material. Some examples: what was the final score of the last football game?

Why do two different stores charge a different price for the same product? Why is one character (from a book or TV show) a better person than another character?

- 2) *Keep* gathering questions until you have at least two of each category (listed below). Tell students that you noticed they not only generated several questions, but also many different types of questions.
- 3) *Explain* that they can categorize their inquiry questions using the arm analogy.

Big Question	Arm	Synthesis
Little Questions	Elbow	Comprehension
	Hand	Recall
	Finger	Yes/no

- *Finger*: requires a “yes” or “no” answer.
 - *Hand*: requires a one-word answer and generally little research.
 - *Elbow*: requires students to read a passage, page, or several pages.
 - *Arm*: requires students to use a variety of sources, synthesize information, and draw their own conclusions.
- 4) *Use* the list to provide some examples.
Go over the list you just created with the class and use an example to help explain each of the categories. For example:
 - *Finger*: Are you in the fifth grade?
 - *Hand*: How long is the Mississippi river?
 - *Elbow*: How are clouds formed?
 - *Arm*: How did the feudal system shape the economy of the medieval times?
 - 5) *Ask* students to finish categorizing the list that you created together.
You can ask all the students to signal what type of question they think it is as you read out the remaining questions.
 - Raising their index finger means it’s a finger question.
 - Waving means it’s a hand question.
 - Pointing to their elbow means it’s an elbow question.
 - Raising their arm means that it is an arm question.

PRACTICE GENERATING DIFFERENT TYPES OF QUESTIONS

- 1) *Divide* the class into groups of four and hand out 12 index/cue cards to each group.
- 2) *Assign* each group to generate three questions for each of the four categories (finger, hand, elbow, arm).
Students should write down one question on an index/cue card. They should **not**



indicate on the cue card which category it belongs to.

- 3) *Have* one student from each group mix up their questions, and then hand out a few to each of the other groups.
Depending on how many students/groups you have in your class, they may not be able to evenly divide their questions. Assure that each group ends up with 12 questions that they did not create themselves.
- 4) *Instruct* each group to determine which category each of the new questions belongs to.
They should write down the category on the other side of the index/cue card.
- 5) *Divide* your whiteboard into four sections with one of the question types used as a header.
- 6) *Have* each student in the groups pick one question type.
They then go up to the whiteboard to write all the questions that they have that fits into that category.
- 7) *Go over* each category with the class and ask if students agree with the classification.
If students in the other groups disagree as to whether a specific question fits the category it is listed under, then have the first group defend their choices. Ask the group that created the question to weigh in as well.

OPTIONAL: HOT POTATO QUESTIONS

- 1) Divide the class into groups of about 3-4.
There should be an equal number of groups as there are sheets of paper.

Teacher Tip

We recommend 8 groups/sheets of paper, but this will depend on the topic you have selected and how you want to help students focus their inquiry. The topic of each paper could be for the roles you have assigned and/or if the topic could be subdivided or focused on a particular theme. For examples, see the thematic projects, found on the teacher resources page.

- 2) *Write* the topic at the top of the sheet and give one to each group.
- 3) *Give* the groups 1.5 minutes to brainstorm as many questions as they can.
This is a brainstorming activity so let groups know that they should record anything that comes to mind.
- 4) *Stop* the students after 1.5 minutes and pass their sheets to another group.
- 5) *Give* the groups another 1.5 minutes to read and add to their new sheet.



- 6) *Rotate* the sheets so that each group has a chance to brainstorm all topics.
- 7) *Review* the questions the students have come up with.
It would be a good idea to post these somewhere in the class as students might want to modify some of these for their project.

DEFINING THE BIG QUESTION

- 1) *Have* students log on to IS-21.
Students should sign into the LTK+ and navigate to the IS-21 task they created in the last lesson.
- 2) *Review* the task description.
Student should reread the task that was assigned to them.
- 3) *Direct* students to complete the **DEFINE** step.
Student should articulate their research topic as a Big Question. They should indicate that their Big Question is an ‘arm’ question. If they need a reminder of the analogy that we use for the different types of questions, suggest they refer to the help in IS-21.

Teacher Tip

Some students find it very difficult to start with a Big Question. If you are finding that this is the case, you can suggest that they try writing some Little Questions first and then determine the common thread to create their Big Question. Direct them to the BRAINSTORM step in IS-21 to do this.

- 4) *Request* that a couple of groups share their Big Question with the class.
- 5) *Use* the **Report** feature of IS-21 to review the students’ work.
IS-21 allows you to view a non-editable report of the students’ IS-21 work. The content that has been entered into their task is viewable via this report, except for the ePEARL windows. Take some time to review what your students have done. It is also recommended that you use the Report to see how students ranked this task’s importance in case you need to increase their motivation.

ePEARL Users

Remember the Report may also be viewed in a student artifact. Think about viewing it there and providing feedback through the Teacher Feedback feature.

Optional Modification to the Lesson

If you do not have access to the computer lab for this lesson, you can use the worksheet entitled “Defining your Big Question”. Have the students get into their groups and review the task description they wrote last class. They can then use the worksheet to brainstorm some possible Big Questions. They should compare these questions to their task description and select the best one. You should circulate to



ensure that everyone has written an appropriate Big Question. Have them input this data into their IS-21 task for homework.

REFLECTION

It is beneficial for students to reflect through the inquiry process and not just at the end of the task. IS-21 is set up so that students are encouraged to reflect after each phase. They are welcome to express any feelings or thoughts that they have about the step or process so far. If required, IS-21 has prompts for each phase that students can refer to as well. There are additional prompts listed on the teacher resource page if you would like to have them broken down by each step. Even if reflection is not a big part of your classroom, we recommend that you have students reflect at least once.

This is an individual task. Students should not be completing this portion with their group member(s).

ePEARL Users

There are two locations that students can reflect- either within their IS-21 task or within the ePEARL artifact that is automatically created whenever a new IS-21 task is started. The reflection ends up in the same place though!

BRAINSTORMING LITTLE QUESTIONS

- 1) *Inform* students that before they start searching, they should make a plan. Students need to plan to successfully search for the answer to their Big Question. IS-21's **BRAINSTORM** step will not only allow them to generate ideas on what to search for (Little Questions) but will help them narrow down this broad topic and call on their prior knowledge.
- 2) *Have* students log on to IS-21. Students should sign into the LTK+ and navigate to the IS-21 task they created in the last lesson. They should be on the **BRAINSTORM** step.
- 3) *Instruct* students to brainstorm about what they already know about their topic. With their partners, students should list their prior knowledge about the research topic.

Teacher Tip

As students are figuring out what they already know about a topic and what they need to find out, have them answer these questions:

- What geographical area or location do I want to focus on?
- What person or group interests me?
- What aspects of my topic interest me?
- Which time period do I want to focus on?



- 4) *Direct* students to start brainstorming some Little Questions.
Ask students what they need to find out to answer their Big Question. These are their Little Questions. In IS-21, they will fill these out in the “what I need to know” section.
- 5) *Encourage* them to write ‘elbow’ or ‘hand’ Little Questions.
This will encourage them to find substantial information to answer their Big Question. If they need a reminder about the analogy we use for the different types of questions, suggest that they use the help feature in IS-21.
- 6) *Encourage* students to list a few things they do not need to look for.

Teacher Tip

If students are having trouble coming up with Little Questions, it might be useful for them to brainstorm with a concept map first. They can group their ideas by themes and then develop a question based on what they have drawn in their map.

This will help narrow down large topics and encourage students to realize that not all the information related to their topic will be relevant to answering their question(s).

- 7) Use the **Report** feature of IS-21 to review the students’ work.

ePEARL Users

Remember the Report may also be viewed in a student artifact. Think about viewing it there and providing feedback through the Teacher Feedback feature.

Optional Modifications to the Lesson

If you do not have access to the computer lab for this lesson, you can use the worksheet entitled “Brainstorming your Little Questions”.

The system will only allow for eight Little Questions to be inputted. It might be beneficial for students to brainstorm ideas on paper and list as many as they can and then select the most appropriate or useful. If students are developing these questions away from the computer, depending on the school’s policy and your classroom practices, completing the step in IS-21 can be assigned as homework.

REFLECTION

For students that have completed the step quickly, suggest they use the extra class time to begin reflecting. Direct them to the reflections window in IS-21 and suggest they use the prompts as needed. There are additional prompts listed on the teacher resource page if you would like to have them broken down by each step.

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This lesson is an adaptation of a lesson from *AT&T/UCLA's Initiative for the 21st Century Literacies'* teacher resources. It was modified with permission.

