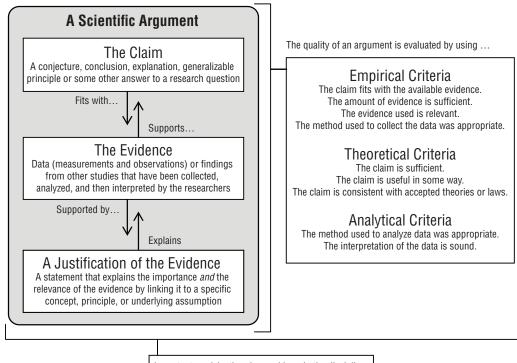


Figure 1. A Framework That Can Be Used to Illustrate the Components of a Scientific Argument and Some Criteria That Can and Should Be Used to Evaluate the Merits of a Scientific Argument



The generation and evaluation of arguments reflect discipline-based norms that include ...

important models, theories, and laws in the discipline; accepted methods for inquiry within the discipline; standards of evidence within the discipline; and the ways scientists within the discipline share ideas.

(c) a relationship between variables, and then they interpret their analysis in light of their research question, the nature of their study, and the available literature. Finally, the justification of the evidence component of the argument is a statement or two that explains the importance and the relevance of the evidence by linking it to a specific principle, concept, or underlying assumption.

It is also important for students to understand that some forms of evidence and some types of reasons are better than others in science. An important component of scientific argumentation involves the evaluation of the acceptability and

Students work in small groups to make sense of the data set and then ...

Generate a
Tentative Argument

Groups then share and critique each other's arguments during an ...

Argumentation Session

The teacher then helps students reflect on what they have learned about the content and the nature of science during ...

The Reflective Discussion

The students then use what they have learned to produce a ...

Final Written Argument

Figure 2. Stages of the Generate an Argument Instructional Model

used to judge argument quality (e.g., the sufficiency of the explanation, the quality of the evidence, and so on). The classroom teacher should have a different student read each section of the activity aloud and then pause after each section to clarify expectations, answer questions, or provide additional information as needed. Once all the students understand the goal of the activity, the teacher should divide

the students into small groups (we recommend three students per group), and move on to the second stage of the model.

## Stage 2: The Generation of a Tentative Argument

The next stage of the instructional model calls for students to use the raw data that is supplied during the first stage of the model to develop an answer to