

Strategy 1

Brainstorming and Discussion



WHAT: DEFINING THE STRATEGY

In my book *Shouting Won't Grow Dendrites*, I created the following rhyme:

They can't talk in class.

They can't talk in the hall.

They can't talk in the cafeteria.

They can't talk at all!



Yet teachers are talking with one another every chance they get—in the lounge, in the cafeteria, in faculty meetings. . . . Need I continue? Are teachers expecting behaviors of students that are unnatural to the brain and those that they themselves would fail to follow?

When people open their mouths to speak, they send more oxygen to the brain. Oxygen is essential to healthy brain development. If the brain is deprived of oxygen for three to six minutes, it is declared dead. I have been in some classrooms where students were breathing, but it was hard to tell. The teacher was doing all the talking while students had their heads on desks, were staring out of the window, or were daydreaming. Students who have opportunities to brainstorm a variety of ideas with their peers without the fear of criticism or sarcasm are those who naturally improve their comprehension and higher-order thinking skills. Consider the following cross-curricular discussion starters:

- The answer is 156. What is the question?
- Discuss the design of an experiment that tests your hypothesis.
- Let's brainstorm other endings to our story.
- If you had been Anne Frank in *The Diary of Anne Frank*, how would you have dealt with her dilemma?



WHY: THEORETICAL FRAMEWORK

When students talk about a topic, they will understand it better because their brains not only mentally process the information but also verbally process it. (Allen, 2008)

Brainstorming or group discussion activities, in cooperation with graphic organizers, encourage all students to contribute. (Jensen, 2007)

Adolescents need to debate issues or participate in discussions around topics relevant to them. This should occur in a physically and psychologically safe environment. (Caine, Caine, McClintic, & Klimek, 2005)

Students up to the age of 10 learn better when an academic discussion is directed by the teacher. Adolescents and adults benefit from discussions led by a cooperative group. (Jensen, 2007)

The most widely known technique for simulating creativity in the brain is probably the act of brainstorming where all ideas are accepted and there is a greater chance of reaching a workable solution. (Gregory & Parry, 2006)

Students with special needs benefit when the class works in groups of fewer than six and the teacher uses directed response questioning so that students have a chance to think aloud. (Jensen, 2007)

Teachers can guide students through very difficult solutions to mathematics problems by using a series of well-thought-out questions that address process rather than procedure. (Posamentier & Jaye, 2006)

Discussion and questioning during whole class or cooperative group learning enable the brain to clarify concepts and hook new information with the information that the brain already knows. (Brooks & Brooks, 1993)



HOW: INSTRUCTIONAL ACTIVITIES

WHO: Elementary/Middle/High

WHEN: Before the lesson

CONTENT AREA(S): All

- Prior to the reading of a story or unit of study, have students peruse any pictures, captions, bold headings, charts, graphs, and so forth to determine what the story or unit will be about. Have them brainstorm a list of questions to be answered as the unit or story is being read. The questions will give students a purpose for reading.

WHO: Elementary/Middle/High

WHEN: During a lesson

CONTENT AREA(S): All

- Give students a content-area question to which there is more than one appropriate answer. Students brainstorm as many ideas as possible in a designated time while complying with the following DOVE guidelines:

- Defer judgment
- One idea at a time
- Variety of ideas
- Energy on task

WHO: Elementary/Middle/High
WHEN: During a lesson
CONTENT AREA(S): All

- Have students work with peers in *families* of four to six. During the lesson, stop periodically and have families discuss answers to questions related to what is being taught. For example, in math class, students could compare their answers to the homework assignment, and when answers differ, they could engage in a discussion to reach consensus as to the correct answer. Have students stay together with their families long enough to build relationships and then change the composition of the families.

WHO: Elementary/Middle/High
WHEN: During or after a lesson
CONTENT AREA(S): All

- When asking questions in class or creating teacher-made tests, provide opportunities for all students to be successful by asking both knowledge or short-answer questions as well as those that enable students to use their reasoning, critical-thinking, and creative-thinking skills. Refer to “Bloom’s Taxonomy Revised” (Figure 1.1, page 15) to ensure that students have opportunities to answer questions at all levels of the revised taxonomy, particularly those above the *knowledge* level.

WHO: Elementary/Middle/High
WHEN: During or after the lesson
CONTENT AREA(S): All

- During cooperative group discussions or as students create original questions for content-area assessments following a unit of study, have them use the question stems in Figure 1.1. These stems will help to ensure that questions are created that represent all levels of the revised Bloom’s taxonomy.

WHO: Elementary/Middle/High
WHEN: During the lesson
CONTENT AREA(S): All

- During discussions, sentence starters similar to the ones listed here are particularly effective for English language learners because they enable all students to take an active part:

- I realize that . . .
 - I agree with _____ that _____.
 - I would like to add to _____'s idea.
 - I don't understand what _____ meant when she said _____.
- (Coggins, Kravin, Coates, & Carrol, 2007)

WHO: Elementary/Middle/High
WHEN: During the lesson
CONTENT AREA(S): All

- Use the **think, pair, share** technique with students. Pose a question or discussion topic to the class. Have them *think* of an individual answer. Then have them *pair* with a peer and *share* their answer. Then call on both volunteers and nonvolunteers to respond to the entire class.

WHO: Elementary/Middle/High
WHEN: During a lesson
CONTENT AREA(S): All

- When asking a discussion question, wait a minimum of five to seven seconds to allow students' brains opportunities to reason out the answer. If, after a five-second minimum, the student does not respond, either rephrase the question, provide additional information, give a clue, or provide the student with question structures or frames such as the following:
 - Why is ____ different from ____?
 - How is this answer similar to the previous answer?
 - What is another way to say it?

WHO: Elementary/Middle/High
WHEN: During a lesson
CONTENT AREA(S): All

- Present a controversial issue to the class, such as, "How can we reduce the high school dropout rate in the United States?" Divide the class in half and have them research and prepare a debate for one side of the issue or another. Then, actually, role-play the debate by having students take turns serving on opposing teams and orally presenting their arguments to the class. You can be the judge on which side was more convincing at the culmination of the debate.

Bloom's Taxonomy Revised

Bloom's Taxonomy (1956) has stood the test of time. Recently, Anderson & Krathwohl (2001) have proposed some minor changes to include the renaming and reordering of the taxonomy. This reference reflects those recommended changes.

I. REMEMBER (KNOWLEDGE)

(shallow processing: drawing out factual answers, testing recall, and recognition)

| <i>Verbs for Objectives</i> | <i>Model Questions</i> | <i>Instructional Strategies</i> |
|-----------------------------|------------------------|---------------------------------|
| Choose | Who? | Highlighting |
| Describe? | Where? | Rehearsal |
| Define? | Which one? | Memorizing |
| Identify | What? | Mnemonics |
| Label | How? | |
| List | What is the best one? | |
| Locate | Why? | |
| Match | How much? | |
| Memorize | When? | |
| Name | What does it mean? | |
| Omit | | |
| Recite | | |
| Recognize | | |
| Select | | |
| State | | |

(Continued)

Figure 1.1 (Continued)

II. UNDERSTAND (COMPREHENSION)
(translating, interpreting, and extrapolating)

| <i>Verbs for Objectives</i> | <i>Model Questions</i> | <i>Instructional Strategies</i> |
|-----------------------------|-------------------------------------|---|
| Classify | State in your own words. | Key examples |
| Defend | What does this mean? | Emphasize connections |
| Demonstrate | Give an example. | Elaborate concepts |
| Distinguish | Condense this paragraph. | Summarize |
| Explain | State in one word . . . | Paraphrase |
| Express | What part doesn't fit? | STUDENTS explain |
| Extend | What exceptions are there? | STUDENTS state the rule |
| Give Example | What are they saying? | "Why does this example . . . ?" |
| Illustrate | What seems to be . . . ? | create visual representation |
| Indicate | Which are facts? | (concept maps, outlines, flow |
| Interrelate | Is this the same as . . . ? | charts organizers, analogies, pro/con grids) <i>PRO/CON</i> |
| Interpret | Read the graph (table). | Note: The faculty member can show them, but <i>they</i> have to do it. |
| Infer | Select the best definition. | Metaphors, rubrics, heuristics |
| Judge | What would happen if . . . ? | |
| Match | Explain what is happening. | |
| Paraphrase | Explain what is meant. | |
| Represent | What seems likely? | |
| Restate | This represents . . . | |
| Rewrite | Is it valid that . . . ? | |
| Select | Which statement supports . . . ? | |
| Show | What restrictions would you add? | |
| Summarize | Show in a graph, table. | |
| Tell | | |
| Translate | | |

III. APPLY

(knowing when to apply; why to apply; and recognizing patterns of transfer to situations that are new, unfamiliar or have a new slant for students)

| <i>Verbs for Objectives</i> | <i>Model Questions</i> | <i>Instructional Strategies</i> |
|-----------------------------|--|---------------------------------|
| Apply | Predict what would happen if . . . | Modeling |
| Choose | Choose the best statements that apply. | Cognitive apprenticeships |
| Dramatize | Judge the effects. | “Mindful” practice—NOT just a |
| Explain | What would result. | “routine practice” |
| Generalize | Tell what would happen. | Part and whole sequencing |
| Judge | Tell how, when, where, why. | Authentic situations |
| Organize | Tell how much change there would be. | “Coached” practice |
| Paint | Identify the results of . . . | Case studies |
| Prepare | | Simulations |
| Produce | | Algorithms |
| Select | | |
| Show | | |
| Sketch | | |
| Solve | | |
| Use | | |

IV. ANALYZE (breaking down into parts, forms)

| <i>Verbs for Objectives</i> | <i>Model Questions</i> | <i>Instructional Strategies</i> |
|-----------------------------|--|---|
| Analyze | What is the function of . . . ? | Models of thinking |
| Categorize | What’s fact? Opinion? | Challenging assumptions |
| Classify | What assumptions? | Retrospective analysis |
| Compare | What statement is relevant? | Reflection through journaling |
| Differentiate | What motive is there? | Debates |
| Distinguish | Related to, extraneous to, not applicable. | Discussions and other collaborating learning activities |

(Continued)

Figure 1.1 (Continued)

| <i>Verbs for Objectives</i> | <i>Model Questions</i> | <i>Instructional Strategies</i> |
|-----------------------------|------------------------------------|---------------------------------|
| Identify | What conclusions? | Decision-making situations |
| Infer | What does the author believe? | |
| Point Out | What does the author assume? | |
| Select | Make a distinction. | |
| Subdivide | State the point of view of . . . | |
| Survey | What is the premise? | |
| | What ideas apply? | |
| | What ideas justify the conclusion? | |
| | What's the relationship between? | |
| | The least essential statements are | |
| | What's the main idea? Theme? | |
| | What inconsistencies, fallacies? | |
| | What literacy form is used? | |
| | What persuasive technique? | |
| | Implicit in the statement is . . . | |

V. EVALUATE (according to some set of criteria, and state why)

| <i>Verbs for Objectives</i> | <i>Model Questions</i> | <i>Instructional Strategies</i> |
|-----------------------------|--|---|
| Appraise | What fallacies, consistencies, | Challenging assumptions |
| Judge | inconsistencies appear? | Journaling |
| Criticize | Which is more important, moral better, logical, valid, appropriate? | Debates |
| Defend | Find the errors. | Discussions and other collaborating learning activities |
| Compare | | Decision-making situations |

VI. CREATE (SYNTHESIS) (combining elements into a pattern not clearly there before)

| <i>Verbs for Objectives</i> | <i>Model Questions</i> | <i>Instructional Strategies</i> |
|-----------------------------|----------------------------|---------------------------------|
| Choose | How would you test . . . ? | Modeling |
| Combine | Propose an alternative. | Challenging assumptions |
| Compose | Solve the following. | Reflection through journaling |

| <i>Verbs for Objectives</i> | <i>Model Questions</i> | <i>Instructional Strategies</i> |
|-----------------------------|----------------------------|-----------------------------------|
| Construct | How else would you . . . ? | Debates |
| Create | State a rule. | Discussions and other |
| Design | | collaborating learning activities |
| Develop | | Design |
| Do | | Decision-making situations |
| Formulate | | |
| Hypothesize | | |
| Invent | | |
| Make | | |
| Make up | | |
| Originate | | |
| Organize | | |
| Plan | | |
| Produce | | |
| Role play | | |
| Tell | | |
| Tell | | |

Figure 1.1 Key Words, Model Questions, and Instruction Strategies

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References

Anderson, L. W., & Krathwohl, D. R. (2001). *A taxonomy for learning, teaching, and assessing*.

Bloom, B. S. (Ed.). (1956). *Taxonomy of educational objectives. The classification of educational goals, by a committee of college and university examiners*. New York: Longmans.

John Maynard, University of Texas, Austin

Marilla Svinicki, University of Texas, Austin



REFLECTION AND APPLICATION

How will I incorporate *brainstorming and discussion* to engage students' brains?

Standard/Objective: _____

Activity: _____

Standard/Objective: _____

Activity: _____