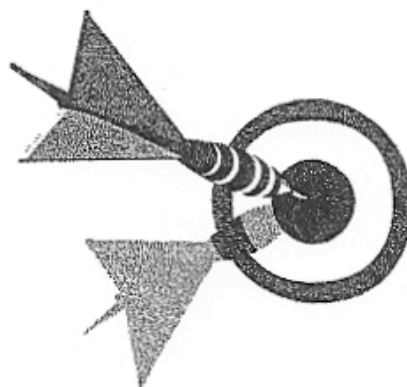


Instructional Strategies That Work: A Tool Kit for Educators

#9: PROVIDING CUES and QUESTIONS



Based on the research and materials of
Dr. Robert Marzano and Dr. Debra Pickering
of the Mid-continent Research for Education and Learning (McREL) Institute
and other sources as noted

Compiled, edited, and expanded by the following Cherry Creek Schools'
S.T.A.R. Mentors: Don Biery, Dina Davis, Roberta Ford, Connie Hirz,
Nan Holt, Valerie James, and Carrie Weinberger.
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CUES, QUESTIONS AND ADVANCED ORGANIZERS

Let's celebrate! The field of education is at a turning point; the "art" of teaching is rapidly becoming the "science" of teaching. This is a relatively new phenomenon as reported by Robert Marzano and Debra Pickering in the ASCD publication, *Classroom Instruction That Works: Research-Based Strategies for Increasing Student Achievement*.

After examining decades of research findings to distill the results, Marzano's team at McRel had defined nine broad K-12 teaching strategies that have positive effects on students a learning:

- Identifying similarities and differences
- Summarizing and note taking
- Reinforcing effort and providing recognition
- Homework and practice
- Nonlinguistic representations
- Cooperative learning
- Setting objectives and providing feedback
- Generating and testing hypotheses
- Questions, cues, and advance organizers

The instructional strategy of cues, questions, and advance organizers has proven in the research to show a percentile gain of 22. Generalizations from the research about cues, questions, and advance organizers include the following:

- Presenting students with information that highlights the important and essential information regarding the topic.
 - Posing students with "higher level" questions
 - Allowing wait time in which students have time to process and formulate answers.
 - Activating prior knowledge through explicit cues, questions that elicit inferences, and analytic questions.
- (Marzano, Pickering and Pollock, 113-114)

The intent of the cues, questions, and advance organizers packet is to give teachers easy access to classroom strategies and models that easily can be adapted into lessons at all grade levels and in all content areas.

This packet includes:

- Definitions of the terminology: cues, wait time, higher level questions, eliciting inferences, analytic questions and skills.
- Steps to the thinking process
- Key points to consider when teaching the processes/concepts
- Models of graphic organizers
- Teacher-structured and student-structured tasks
- Bibliography

Meta-Analysis of Research On Instruction

	ES	P Gain	N	SD
Identifying similarities and differences	1.61	45	31	.31
Summarizing, note taking	1.00	34	179	.50
Reinforcing effort and providing recognition	.80	29	21	.35
Assigning homework and practice	.77	28	134	.36
Generating nonlinguistic representations	.75	27	246	.40
Using cooperative learning	.73	27	122	.40
Setting objectives and providing feedback	.61	23	408	.28
Generating and testing hypotheses	.61	25	63	.79
Providing cues, questions, and advanced Organizers	.59	22	1,251	.26

ES = average effect size.

P Gain = percentile gain (the maximum percentile gains possible for students currently at the 50th percentile).

N = number of effect sizes.

SD = standard deviation (the measure of the variability of scores around the mean).

When conducting a meta-analysis, a researcher translates the results of a given study into a unit of measurement referred to as an effect size. An effect size expresses in standard deviations the difference between the increased or decreased achievement of the experimental group with that of the control group. One of the more useful aspects of an effect size is that it can be easily translated into percentile gains. Being able to translate effect sizes into percentile gains can lead to dramatic interpretations of the possible benefits of a given instructional strategy.

Robert Marzano
from *What Works In Classroom Instruction*, McRel, 2000

3. Definitions of terminology

- **Cues and questions** are ways for teachers to help students activate prior knowledge. Inherent to this process is facilitating students in retrieving information from their “mental files” or long-term memory banks. Students use what they already know and apply that knowledge to new information.
- **Wait time** is the response time given to students.
- **Eliciting inferences** refers to the questioning techniques done by teachers in order for students’ to “fill in the informational blanks” that are created in the course of encountering text, lecture, or lesson.
- **Analytic questions** are those which require students to do just that--analyze, critique, and even pass judgment. In order to do this, students need to possess analytical skills in which they locate errors, generate support, or probe the perspective from which information is derived. (Marzano, Pickering and Pollock)

II. Implementation

- A. Focus on what is important within the text or the topic rather than on what is unusual. Teachers often select unique or bizarre aspects of a topic with hopes of arousing interest within students. Research supports the notion that a deeper understanding of the concept or idea creates interest in a topic.
- B. Higher-level questions produce a more meaningful understanding of the topic than do lower-level questions. Our goal as teachers, then, is to ask children questions that require them to analyze and synthesize information rather than just recall facts or recognize information. Questioning strategies should actively involve all students in the learning process. All students should be allowed and encouraged to make an effort to prepare a response and partake in higher-level thinking (Marzano, Pickering and Pollock). See "Ideas for Implementing Higher-Level Questioning" on page 8.
- C. Wait time is an essential element when asking students to generate answers that are both thoughtful and convey deep understanding. See "Ideas for Increasing Wait Time" on page 9.
- D. Establish a mental set. Ask questions *before* the actual learning experience takes place. Questioning is not something that only happens after the learning experience. Many educators reference this as “activating background knowledge or schema.” Students can then

attach this new learning to their already established personal experiences and prior knowledge (Marzano, Pickering and Pollock). See "Ideas for Establishing a Mental Set" on page 10.

III. Types of Questions

- A. **Explicit Cues**-These are straightforward ways of activating prior knowledge. Teachers are able to provide students with a preview of what they are about to experience, by using explicit cues. (Marzano, Pickering and Pollock)
- B. **Questions to Develop Thoughtful Students**-These questions aid students in being able to find missing information.

1. Questions of **Clarification**

- What do you mean by_____?
- What is your main point?
- Could you put it another way?
- Could you give me an example?
- Would you say more about that?
- Is your basic point _____or _____?
- What do you think _____ meant by his remark?

2. Questions that probe **Assumptions**

- What are you assuming?
- What is _____ assuming?
- You seem to be assuming_____. How do you justify taking that for granted?
- Is that always the case?
- Why do you think that assumption holds here?
- What could we assume instead?

3. Questions that probe **Reasons and Evidence**

- What would be an example?
- What are your reasons for saying that?
- Are the reasons adequate?
- But is that good evidence to believe?
- What would you say to someone who said_____?
- By what reasoning did you come to that conclusion?
- How do you know?
- Why did you say that?
- How does that apply in this case?
- What difference does that make?

- What would convince you otherwise?

4. Questions about **Viewpoint, Perspectives**

- You seem to be approaching this issue from _____'s perspective. Why have you chosen this position rather than that position?
- What is an alternative?
- Can/did anyone see this another way?
- When you say _____, are you implying _____?
- What would someone that disagrees say?
- What effect would that have?
- What is the probability or certainty of this happening?
- Is this the same issue as _____?
- Do we understand the question?
- Why is this an easy or difficult question to answer?
- To answer this question, what other questions do we need to answer first?
- What else does this question ask us to evaluate?
- Why is this question important?
- What does this question assume?
- Can we break the question down at all? (Boord)

5. Questions that **Elicit Inferences**

a. Things/People:

- What action does this thing or person usually perform?
- How is this thing usually used?
- What is the process for making this thing?
- Does this thing have a particular taste, feel, smell, and sound?
- Does this thing have a particular color, number, location or dimensionality?
- How is this thing usually sold?

b. Actions:

- What persons or thing usually performs this action?
- What effect does this action have on the taste, feel, sound or look of this thing?
- How is the value of a thing changed by this action?
- How does this action change the state of a thing?

c. Events:

- During what season or time of year does this event usually take place?
- At what time of day does this event usually take place?
- At what point in history did this event take place?

d. States (of Being):

What is the basic process involved in reaching this state?
(Marzano, Pickering and Pollock)

Some of these questions are good to set up an activity to get students involved with the material and to aid the students in figuring out missing information. To follow up the activity or at the completion of an activity, questions are an excellent means of helping students make inferences.

C. **Analytic Questions**--These are questions that require students to critique and analyze the information that has been presented to them.

1. Analyzing Error--This deals with the identifying and articulating errors in the logic of information.
 - How is this information misleading?
 - How could it be corrected or improved?
2. Constructing Support--This is the constructing of a system of support or proof for an assertion.
 - What is the argument that would support the following claim?
 - What are some of the limitations of this argument?
3. Analyzing Perspectives--This is the identification and articulation of personal perspectives about an issue.
 - Why would someone consider this to be good or bad?
 - What is the reasoning behind his or her perspective? (Marzano, Pickering and Pollock)

Ideas for Implementing Higher-Level Questioning

Beam, Focus and Build

- **Beam** Address a question to the entire class. *Ex. What societal aspects should be considered before declaring war?* By asking students to jot down their responses on stickies, the teacher is providing an organizer for student thinking. Be specific. *Jot down 3 responses to this question.*

Some possible prompts:

- *What do you know about...?*
- *Can you explain...?*
- *Would you expect...?*
- *What if...?*
- *Imagine yourself (and why)...?*

- **Focus** Teacher determines how students will respond.

Suggested strategies for involvement:

- Raise your hand
- Names in a cup
- Assign numbers and choose randomly
- *Whip Around Pass Option*-All students respond to the question or pass
- *Question, All Write*- Before responding, all students might write an answer to the question.
- *Outcome Sentences*- These require students to synthesis the content of the discussion or the text.

Try...

I learned...

I rediscovered...

I am beginning to wonder...

I feel...

I want more information about...

Be certain to choose a format that does not exclude any students.

- **Build** Constantly solicit answers from a number of students. Create an environment that encourages open-ended, higher-level involvement. Do not accept only one answer. (Wigle)

Ideas for Increasing Wait Time

- Maintain a sustained silence for 5 seconds. Count the seconds.
- Once a student answers, respond with a declarative statement.
- Respond to a student's answer with a reflective statement...restate the student's thoughts; in other words bringing clarity to the concept.
- Encourage elaboration.
- Express wonder or perplexity over the student's thinking.
- Elicit student comments that build upon the initial student's response.
- Elaborate on the thought. Encourage students to do the same. (Mathers)

Ideas for Establishing a Mental Set

- Create a KWL (What we know, What we want to know, What we Learned) chart with the class. On a three-column chart, brainstorm the first two columns as a preteaching warm-up. Often this process helps to understand students' preconceptions and misconceptions.

Know	Want to know	Learned

- Have students generate a list of connections...topic to self (T to S), topic to text (T to T) and topic to world (T to W.) Following the lesson have students attach key lesson points to their previous established list. Additionally, generate any new questions that have evolved via this process. (Tovani)
- Learning logs serve as a "journal" for what students know and what new knowledge they are acquiring. Students can read back and reflect on the collection of knowledge they are gaining.
- Within the pre-lesson, use timelines, illustrations, pictures and stories to build interest. Often by accessing different modalities, children are able to make learning connections.
- Punctuate classroom discussions with... *What is confusing you at this point of the discussion regarding this topic? What is the essential learning you have gleaned from this discussion?*
What information would you pass on to others regarding this topic?(Wilén)

Discussion Group Conversation Active Listening

- Look at the speaker and listen carefully
- Use eye contact to group members when speaking
- Use names in your agreement or disagreement

Participation, Clarification and Questions

1. I agree with _____(name) because...
2. I agree with _____(name) but would like to add...
3. I disagree with _____(name) because...
4. That's a good point, however...
5. I hear what you are saying, but what about...
6. I'm confused about...and could you elaborate...
7. So, what you mean is...
8. Can you give me another example of...?
9. What if...
10. What do you think _____(name) about...?

Discussion Group Conversation

This activity provides a structure for students to collect their thoughts before the discussion group. All students are accountable for their ideas even if they do not participate in the discussion.

1. Take a position about the topic read. (taking a position)
2. Give specific examples to support your viewpoint from the reading. (making a relevant comment)
3. What question do you have about the reading? (drawing another person in the conversation)
4. Do you see any causes and effects from what happened? (using evidence to support)
5. Create an analogy about your position. (making an analogy)
6. Make your own judgment or evaluations about the issue. (drawing another person into the discussion)
7. Do you have any predictions about what may happen? (moving the discussion along)
8. Give personal connections or identifications. (making a relevant comment)

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