



CRS

COMMUNITY RESOURCES FOR SCIENCE
practical support for great science teaching

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During Engage

Stimulation and Connection

During Explore

Hands-On Experiences

During Explain

Constructing New Concepts

During Elaborate

Applying New Knowledge

Practices

Gather attention with upbeat pace and fast participation.	Make experience accessible with clear directions: Say it, Write it, Show it	Focus on questioning and listening. Start with broad questions, ask for evidence, and lead up to reasoning questions about main topic.	Provide a challenge or application of the new ideas or skills to another situation.
Invite curiosity, wondering and predictions.	Answer questions with directions or questions that promote thinking and exploring. (Example: <i>How do I do this? What do I do next? Where are you in the directions? Have you tried ___?</i>)	Keep discussion going: request alternative opinions or ideas, encourage questioning among students, stay in facilitator role, use accepting responses for all contributions.	Use focused questions to prompt discussion of generalized ideas from explore and application.
Use accepting responses to give value to any speculation and encourage investigation	Allow for unexpected results, erroneous speculation, non-scientific vocabulary: use either passive or empathic accepting responses and suggestions for retesting to confirm results.	Allow students to build thoughts for all reasoning questions: 3-second wait, think/pair/share, time to write	Introduce new scientific vocabulary as a tool for capturing ideas
Recognize personal connections and stories, but suggest another time to share if too long.	Keep your hands “in your pockets” - don’t take over or touch student materials	Be equitable in student selection: class sticks, sharing stick, group reporting, choosing new responders, allowing physical whole group response.	Strengthen memory of idea: map ideas, say and write big idea in appropriate vocabulary
Avoid rhetorical questions about what you are about teach.	Let students record data and thoughts immediately after observations.	Involve reluctant students: multiple mediums for sharing, private written answers, conferring allowed	

Questions

Use confirming questions to whole group to check recall of prior knowledge or vocabulary <ul style="list-style-type: none"> • <i>What do you remember about what we were working on?</i> • <i>What did we call that?</i> 	Use observational and comparative questions to improve observation, accurate data gathering, and sorting skills. <ul style="list-style-type: none"> • <i>How would you describe ...?</i> • <i>How many? how long?</i> • <i>Have you looked at ___?</i> • <i>How are they alike or different?</i> • <i>What information do we need to record?</i> 	Use broad questions to start discussion and help students categorize and order observations. <ul style="list-style-type: none"> • <i>What did you observe?</i> • <i>What did you find out about ___?</i> • <i>How is this the same or different from ___?</i> • <i>Does this remind you of something else?</i> • <i>What do you now know about the characteristics of ___?</i> 	Use broad questions to help students apply knowledge to another situation. <ul style="list-style-type: none"> • <i>Based on what you just figured out, how would you ___?</i> • <i>How can we use what we found out to help solve ___?</i> • <i>Can you think of another way to ...?</i>
Use broad questions that everyone will be able to answer to build common connections. <ul style="list-style-type: none"> • <i>Can you share an experience you've had with ___?</i> • <i>Have you ever seen ...? What was it like?</i> • <i>Imagine yourself in/as a ___, what would you do/eat/see/...?</i> • <i>How would you describe what you just saw?</i> 	Use challenging questions to prompt curiosity and challenge the student to problem solve and test <ul style="list-style-type: none"> • <i>Do you think all ___ does that?</i> • <i>What happens if ...? Have you tried ...?</i> • <i>Can you find a way to make ___ happen?</i> • <i>Can you find a way to determine...?</i> 	Use evidence-based reasoning questions to build concepts. <ul style="list-style-type: none"> • <i>Can you think of a possible explanation for ___?</i> • <i>What observations might support that explanation?</i> • <i>What other factors might be involved?</i> • <i>What might another explanation be?</i> 	Use reflective questions to help students retain and see idea progression. <ul style="list-style-type: none"> • <i>How does this idea compare with your beginning prediction?</i> • <i>has your idea about what's happening changed? What changed your mind?</i>