

## *Research-based teaching tip*

# Best practices for developing educational activities

### Planning – build your session around three key elements:

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#### Practice

- Allocate class time for practice.
- Use questions/problems that align with exams.
- Include questions requiring the use of prior knowledge: explicitly remind students to use prior knowledge.

#### Logic Development

- Use questions/problems that require critical thinking.

#### Accountability

- Make activity participation worth course points (ideally for participation not correctness).

### Implementation – three steps:

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#### Explain your approach

- Encourage logic development
  - Remind students to explain their answers, making clear their reasoning.
- Reduce apprehension
  - Remind students that mistakes are a necessary part of the learning process.

#### Engage students to promote learning

- Logic development
  - Give students time to problem solve individually before any other form of engagement.
  - Have students discuss in groups before whole class discussion/debrief.
  - Do not reveal clicker histogram or provide hints between iterations of engagement.
- Accountability
  - Avoid relying on volunteers – instead, have students work in small groups.
  - For whole class discussions, call on many students via cold or random call.
- Reducing apprehension
  - Use random call to spread participation in discussions.
  - Praise class effort.
  - Make sure students know their contributions to large class discussions are appreciated.
  - Avoid demeaning student answers.

## Debrief

- Practice
  - Have students explain their answers in front of whole class so instructor/students can provide immediate respectful feedback.
- Logic development
  - Call on students to explain their logic.
  - Be sure the logic behind the right answer is explained.
  - Frequently explain why alternative answers are incorrect.
- Accountability
  - For whole class discussions, call on many students via cold call or random call.
- Reducing apprehension
  - Make sure students know their contributions to debriefs are appreciated.
  - Emphasize how incorrect answers contribute to learning and are valuable.
  - Praise students for hard work and effort rather than for being “correct” or “smart”.

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## Sources:

Eddy SL, Converse M, Wenderoth MP. PORTAAL: A Classroom Observation Tool Assessing Evidence-Based Teaching Practices for Active Learning in Large Science, Technology, Engineering, and Mathematics Classes. Schinske J, ed. CBE Life Sciences Education. 2015;14(2):ar23. doi:10.1187/cbe.14-06-0095.