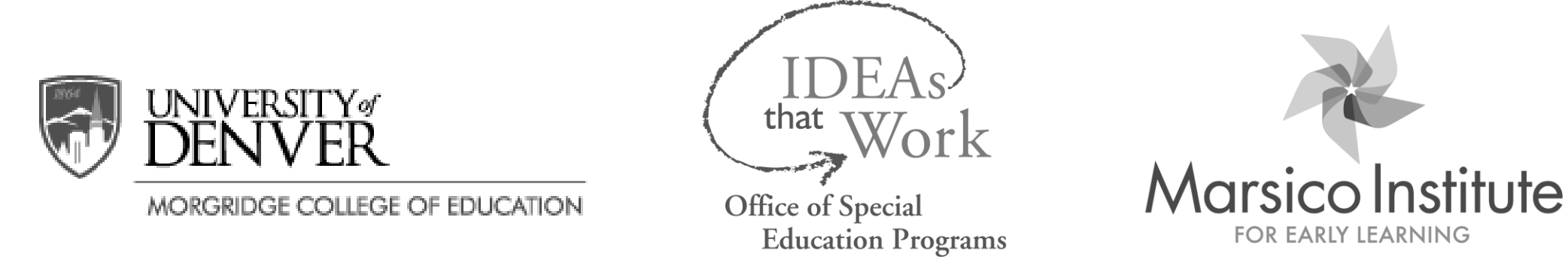


Developing Progression Steps for Science, Technology, and Engineering

UNC FRANK PORTER GRAHAM CHILD DEVELOPMENT INSTITUTE

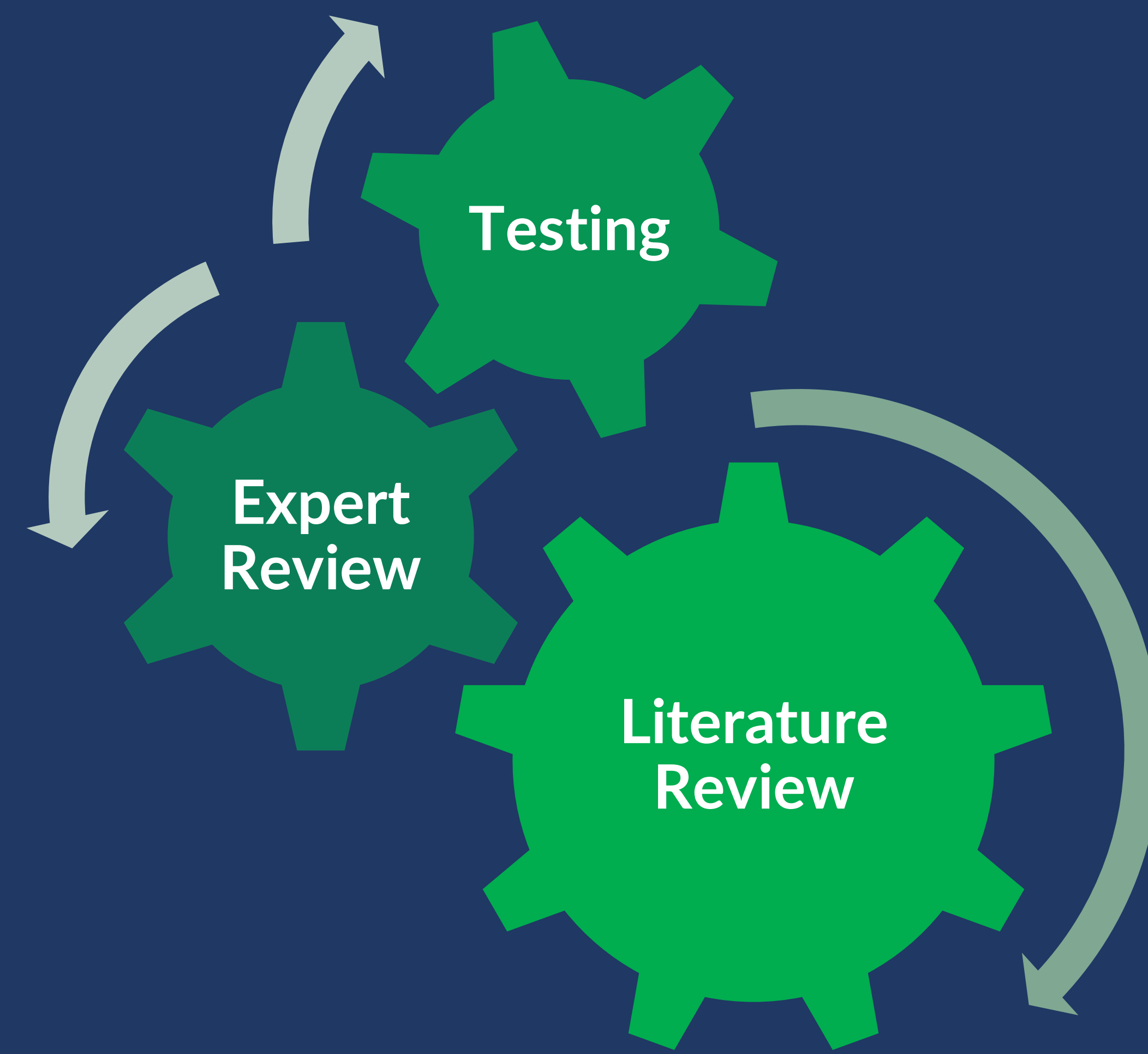


Christine Harradine, PhD and Douglas H. Clements, PhD

WHAT ARE PROGRESSION STEPS?

- Paths along which children develop more sophisticated levels of thinking.
- “What to Expect” as children learn.
- A key part of a learning trajectory
 - A goal
 - **The developmental path along which children move toward that goal**
 - Set of activities and guided instruction matched to the steps along the path

OUR PROCESS



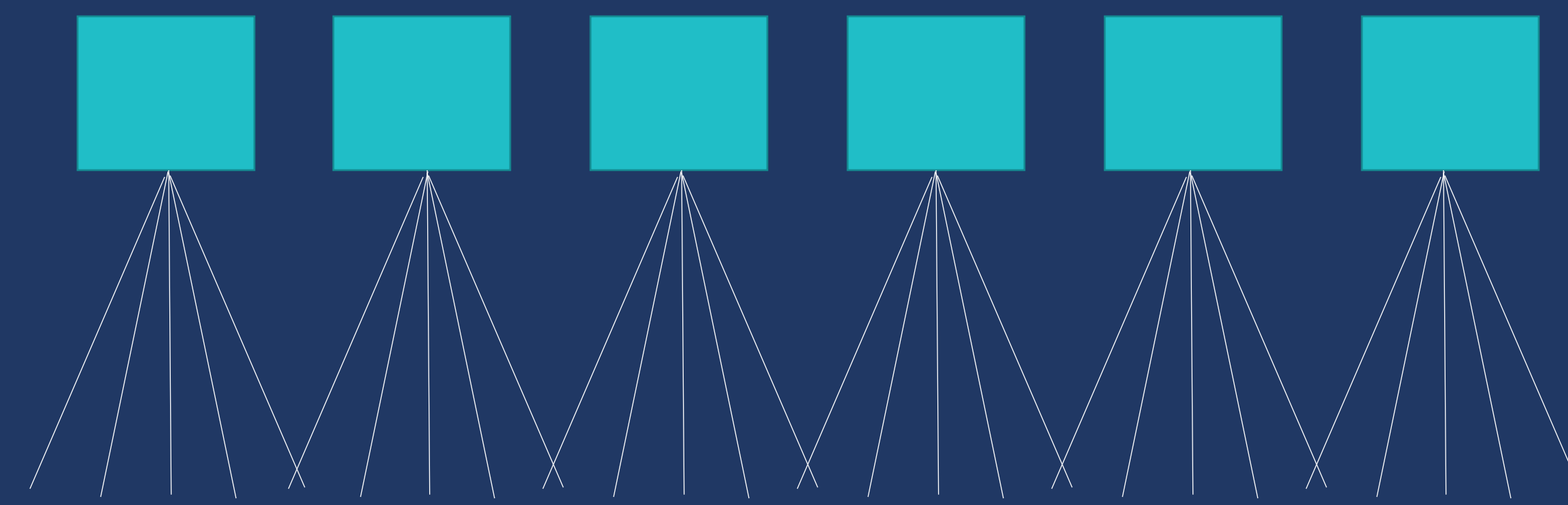
Iterative process of reviewing the literature, discussing with domain area experts, and testing the steps in STEMIE’s incubator sites

Progression steps emergence shown from birth to 7 years

TECHNOLOGY

6 Big ideas and Processes

- Causation
- Debugging
- Decomposition
- Looping
- Repetition
- Sequencing

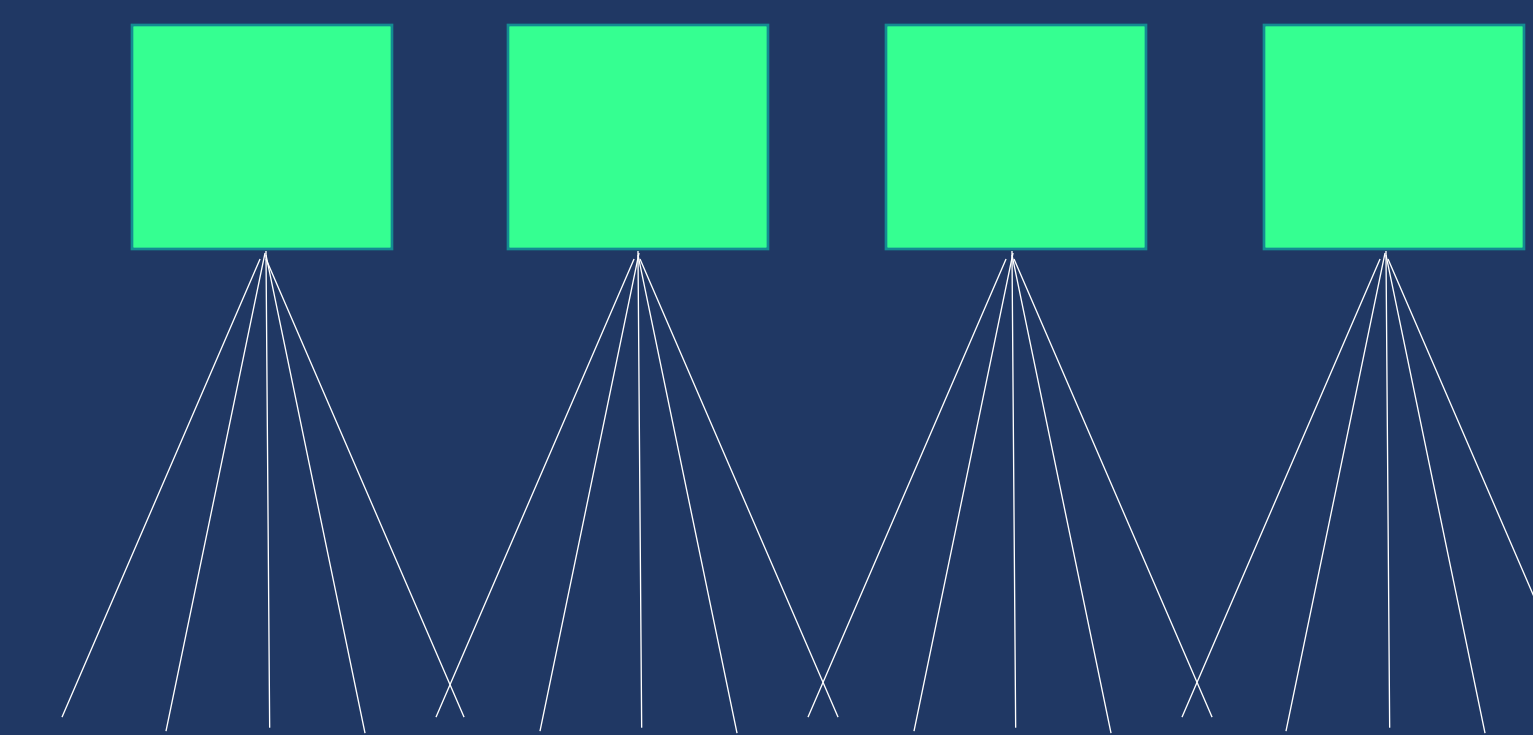


Each big idea has between 3 and 12 steps

ENGINEERING

4 Big ideas and Processes

- Ask
- Create
- Improve
- Test

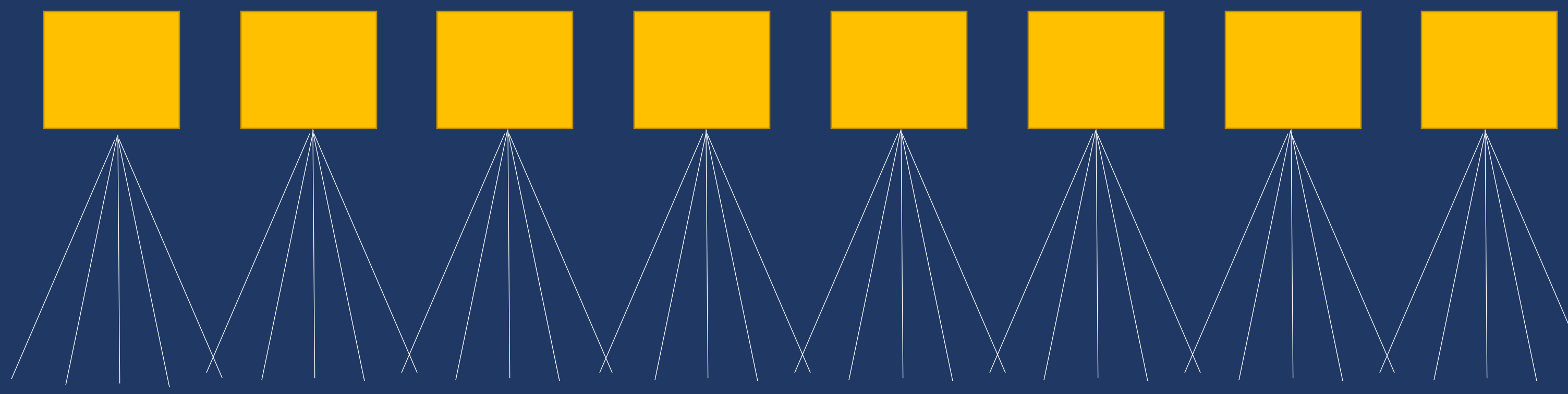


Each big idea has between 6 and 13 steps

SCIENCE

8 Big ideas

- Earth and space science – properties
- Earth and space science – weather
- Life science – living and nonliving things
- Physical science – energy and matter
- Physical science – forces and motion
- Physical science – light
- Physical science – sound
- Physical science – structure and properties of matter



Each big idea has between 4 and 17 steps

DISCUSSION QUESTIONS

1. How will you use progression steps in your work with young children and STEM learning?
2. What resources would help you to use progression steps in your work with young children?

NEXT STEPS

1. Expert review of the current big ideas and associated progression steps.
2. Build consensus on proposed revisions and finalize new version.
3. Use and test revised sets of steps in STEMIE incubator sites.

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