Two Mindsets

Fixed Mindset
- Intelligence is static
- Leads to a desire to look smart and therefore a tendency to avoid challenges
- Legislation and obstacles
- Effort seen as fruitless or worse
- Criticism is ignored
- Success of others is threatening

Growth Mindset
- Intelligence can be developed
- Leads to a desire to learn and therefore a tendency to embrace challenges
- Success and obstacles are a means to an end
- Effort seen as path to mastery
- Criticism is learned from
- Success of others is inspiration

As a result, they may plateau early and achieve less than their full potential.
As a result, they reach even higher

Building a Mathematical Mindset Community

Communication and Collaboration: Are valued
- Teachers work in groups sharing ideas and visuals.
- Students relate ideas to previous lessons or topics.
- Teachers create opportunities for students to see connections.

The Classroom is OPEN
- Students work in groups sharing ideas and visuals.
- Students relate ideas to their peers' ideas.
- Teachers seek feedback from others.

The Environment is FILLED WITH CHALLENGE
- Teachers extend their work and investigate.
- Teacher invites curiosity when posing tasks.
- Teachers see maths as an important puzzle.

The Maths is VISUAL
- Students work in groups sharing ideas and visuals.
- Students relate ideas to previous lessons or topics.
- Teachers create opportunities for students to see connections.

The Teachers are OPEN
- Students are invited to see maths differently.
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Graphic by Nigel Holmes based on research by Carol Dweck
http://www.ed.gov

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**OUTCOME** | **Watch For**
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**GROWTH MINDSET** | • Completing all 3 of the fundamental growth mindset techniques during each session:
  - □ Praising a student’s effort, regardless of outcome
  - □ Asking a student to find, correct, and describe at least one mistake
  - □ Using open tasks to help a student think through problems and ideas

**STUDY STRATEGIES/TIME MANAGEMENT** | • Questions about:
  - ○ class notes
  - ○ class attendance
  - ○ test preparation techniques
  - ○ study/work/school schedule
• Suggesting appropriate changes in habits/schedule
• Referrals to Success Coaching
• Engaging student in evaluating effectiveness of their study habits and schedule
• Practicing accepted changes with student before they leave

**INDEPENDENT LEARNING** | • Asking student what they have done so far to learn the material
• Redirecting questions
• Having student look things up (rather than tutor doing so)
• Student doing most of the writing or typing ("student has the pencil")
• Providing adequate wait time
• Asking student to summarize their knowledge/understanding
• Using probing questions to instill deeper understanding of material

**PROBLEM SOLVING** | • Having student verbalize the steps they take to solve a problem
• Teaches 4-step problem solving process
  1. has student identify and define the given and unknown parts of problem
  2. helps student devise a solution plan (i.e., comparing to other problems in hw and text)
  3. allows student to carry out the plan on their own as much as possible
  4. helps student assess whether or not plan was successful
• Giving student another problem to work on alone for practice

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**SCIENCE MOTIVATION QUESTIONNAIRE II (SMQ-II)**

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In order to better understand what you think and how you feel about your science courses, please respond to each of the following statements from the perspective of “When I am in a science course...”

<table>
<thead>
<tr>
<th>Statements</th>
<th>Never 0</th>
<th>Rarely 1</th>
<th>Sometimes 2</th>
<th>Often 3</th>
<th>Always 4</th>
</tr>
</thead>
</table>
01. The science I learn is relevant to my life. |         |         |             |         |          |
02. I like to do better than other students on science tests. |         |         |             |         |          |
03. Learning science is interesting. |         |         |             |         |          |
04. Getting a good science grade is important to me. |         |         |             |         |          |
05. I put enough effort into learning science. |         |         |             |         |          |
06. I use strategies to learn science well. |         |         |             |         |          |
07. Learning science will help me get a good job. |         |         |             |         |          |
08. It is important that I get an “A” in science. |         |         |             |         |          |
09. I am confident I will do well on science tests. |         |         |             |         |          |
10. Knowing science will give me a career advantage. |         |         |             |         |          |
11. I spend a lot of time learning science. |         |         |             |         |          |
12. Learning science makes my life more meaningful. |         |         |             |         |          |
13. Understanding science will benefit me in my career. |         |         |             |         |          |
14. I am confident I will do well on science labs and projects. |         |         |             |         |          |
15. I believe I can master science knowledge and skills. |         |         |             |         |          |
16. I prepare well for science tests and labs. |         |         |             |         |          |
17. I am curious about discoveries in science. |         |         |             |         |          |
18. I believe I can earn a grade of “A” in science. |         |         |             |         |          |
19. I enjoy learning science. |         |         |             |         |          |
20. I think about the grade I will get in science. |         |         |             |         |          |
21. I am sure I understand science. |         |         |             |         |          |
22. I study hard to learn science. |         |         |             |         |          |
23. My career will involve science. |         |         |             |         |          |
24. Scoring high on science tests and labs matters to me. |         |         |             |         |          |
25. I will use science problem-solving skills in my career. |         |         |             |         |          |

Note: The SMQ-II is copyrighted and registered. Go to [http://www.coe.uga.edu/smq/](http://www.coe.uga.edu/smq/) for permission and directions to use it and its discipline-specific versions such as the Biology Motivation Questionnaire II (BMQ-II), Chemistry Motivation Questionnaire II (CMQ-II), and Physics Motivation Questionnaire II (PMQ-II) in which the words biology, chemistry, and physics are respectively substituted for the word science. Versions in other languages are also available.