

Active and Exploratory Instruction for Middle School

What are active and exploratory instructional strategies for middle school learners?

These strategies stress what students do, under your direction and facilitation. They actively engage students in a range of hands-on activities, cooperative learning, and peer-teaching. They get students excited. They “hook” them on topics and make them want to learn more. They also feed students’ curiosity, desire to explore, and creativity. As students build their knowledge, they engage in cycles of questioning, exploring, and questioning again. These approaches can help you meet the learning needs of your middle school students.

How do active and exploratory instructional strategies impact teaching?

- They change the pace of learning. It takes time for students to ask questions and explore ideas. Teachers may need to allocate class time in new ways.
- They are student-centered. Students take ownership of their learning as they take risks and seek answers. The teacher’s role in the classroom changes as they support—not lead—students’ explorations.
- They rely on thoughtful, purposeful questions. To support students’ thinking, teachers need to build thoughtful questions into their lessons. They also must anticipate the kinds of questions students might raise during a lesson. Effective questioning strategies are crucial.

What would these strategies look like in your middle school classroom?

Teachers can incorporate active and exploratory instructional strategies into every lesson. Consider the examples below, where students learn through actively exploring content. Note also the role that the teacher plays.

Example: English Language Arts

You ask your students to work in small groups to deepen their understanding of the core themes in the novel you are studying. Each group comes up with analysis-level questions about the book. You add each group’s questions to a master list. Then you give students two days to work on them. You remind them to find evidence in the book to support their ideas. On the third day, students participate in a fishbowl activity. Five students discuss one of the analysis questions while the rest of the class watches. A second group of five discusses another question. The activity runs until all students share their ideas “in the fishbowl.”

Example: Mathematics

To launch a unit on geometry, you ask your students to tackle a problem: “For an assembly, the principal wants the guest speaker to stand in the exact center of the gym. The gym is a rectangle. Can you figure out where the center is without measuring?” Students work in small groups to brainstorm ways to find the center of the gym. Each group reports its strategies to the class, and you record their ideas, letting them lead the discussion. The next day, you all go to the gym and your students test out the most commonly identified ideas.

Example: Science

As part of a unit on heat transfer, your students work in small groups to find out the cooling rate of hot water in different containers: metal, paper, plastic, and glass. They place a thermometer in each container of hot water. Then, they put each container in a tub of ice water. Every 30 seconds, they take the temperature of the hot water and the temperature of the surrounding ice water—recording the data in their science notebooks. Next, groups determine how to vary the set-up. One group decides to place each container of hot water in a solution of ice, salt, and water. It compares the data from both experiments by creating cooling curves to analyze the results.

Can active and exploratory instructional strategies work in a standards-based environment?

The national standards in English language arts, math, and science all advocate active and exploratory instruction. Here's what these standards have to say:

English Language Arts

The International Reading Association's (IRA) and National Council of Teachers of English's (NCTE) *Standards for the English Language Arts* (1996) call for students to play an active role in learning:

- Apply a wide range of strategies to comprehend, interpret, evaluate, and appreciate texts.
- Use a wide range of writing strategies and use writing process elements to communicate with different audiences for various purposes.
- Conduct research by generating ideas and questions, and by posing problems.
- Gather, evaluate, and synthesize data from various sources to communicate their discoveries in ways that suit their purpose and audience.
- Participate as knowledgeable, reflective, creative, and critical members of a variety of literacy communities.

Math

The National Council of Teachers of Mathematics' (NCTM) *Principles and Standards for School Mathematics* (2000) state that teachers of mathematics should:

- Pose questions and tasks that elicit, engage, and challenge each student's thinking.
- Ask students to clarify and justify their ideas orally and in writing.
- Promote classroom discourse in which students listen to, respond to, and question the teacher and one another; initiate problems and questions; and make conjectures and present solutions.
- Enhance discourse by encouraging the use of: tangible models; pictures, diagrams, tables, and graphs; written hypotheses, explanations, and arguments; and oral presentations and dramatizations.
- Expect and encourage students to: work independently or collaboratively to make sense of mathematics; take intellectual risks by raising questions and formulating conjectures; and display a sense of mathematical competence by validating and supporting ideas with mathematical argument.

Science

The National Committee on Science Education Standards and Assessment and the National Research Council's *National Science Education Standards* (1996) state that science teachers should:

- Plan an inquiry-based science program for their students.
- Guide and facilitate learning.
- Orchestrate discourse among students about scientific ideas.
- Challenge students to accept and share responsibility for their own learning.
- Encourage and model the skills of scientific inquiry, as well as the curiosity, openness to new ideas and data, and skepticism that characterize science.
- Nurture collaboration among students.

Questions about active and exploratory instruction

- How do I tap into students' curiosity when planning a lesson?
- What kinds of instructional strategies have I found to be effective in promoting students' exploration of ideas?
- Why is it important for students to teach other students? What are the challenges of placing students in the role of teacher?
- What kinds of questions have I found to be most powerful? What kinds elicit students' thinking, challenge students' ideas, or extend students' understanding?

REFERENCES

- Bransford, J., Brown, A., Cocking, R. (Eds.); Committee on Developments in the Science of Learning, National Research Council. (1999). *How people learn: Brain, mind, experience, and school*. Washington, DC: National Academy Press. Available for free online at: http://www.nap.edu/catalog.php?record_id=6160#toc
- International Reading Association and the National Council of Teachers of English. (1996). *Standards for the English language arts*. United States of America: Authors. Available for free at: <http://www.ncte.org/library/NCTEFiles/Resources/Books/Sample/StandardsDoc.pdf>
- National Committee on Science Education Standards and Assessment, & National Research Council. (1996). *National science education standards*. Washington, DC: National Academy Press. Available for free at: http://books.nap.edu/openbook.php?record_id=4962&page=R1
- National Council of Teachers of Mathematics. (2000). *Principles and standards for school mathematics*. Available for free to members or for purchase at: <http://www.nctm.org/catalog/product.aspx?ID=719>
- The National Forum to Accelerate Middle-Grades Reform (2007). *What are schools to watch?* Retrieved [2009], from <http://www.schoolstowatch.org/OurCriteria/tabid/118/Default.aspx>
- National Middle School Association. (2003). *This we believe: Successful schools for young adolescents*. Westerville, OH: National Middle School Association.
- Wood, C. (2007). *Yardsticks: Children in the classroom ages 4–14* (3rd ed.). Turners Falls, MA: Northeast Foundation for Children.