

## Guiding Principles for Science

### **Developed by Phase I Team, Edited and Supported by Phase II Team**

It is the belief of the Phase I Science Committee that the following principles should guide the teaching and learning of science in the Treynor Community School District and influence our decision and our actions, recognizing that as goals and strategies change, it is our principles that must remain steadfast.

- A strong foundational knowledge of science across grades K-12 should assure a balance between time spent performing field experiments and time spent learning the underlying theories of science.
- Students of science must be connected to Authentic Learning Experiences<sup>1</sup> where they are solving real-world problems through an inquiry- and question-based approach, which develop intellectually curious, high-achieving learners.
- A passion for science should be ignited and supported through the following:
  - a positive learning environment,
  - quality teachers as facilitators of learning,
  - collaboration among students and staff,
  - ongoing experiences with critical thinking and questioning,
  - appropriate resources,
  - engaged and informed family and community members who advocate for the students' learning and success.
- A safe learning environment is important for students of science to assure the freedom to make mistakes and even to fail in order to learn from those opportunities.
- Experiences in science are based on carefully designed, three-dimensional learning<sup>2</sup> with a coherent<sup>3</sup> instructional sequence, which contain clear, focused learning goals, multiple opportunities to achieve the intended learning, investigation into careers in science, and assessments that inform instruction and provide evidence for the students' progress toward mastery learning.
- Effective teaching, with appropriate integration of English Language Arts(ELA)/literacy and mathematics,<sup>4</sup> support for teacher learning, and resources are essential for the success of students of science.
- The district must remain cognizant of the importance of ACT test scores for impacting college acceptance and scholarship considerations.

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<sup>1</sup> **Authentic Learning Experiences:** Students engage in the process of science as it is practiced in the authentic scientific community. Therefore, students should be working to “figure out” a scientific phenomenon or engineering problem and investigations should be focused on scientific phenomena that are relevant and important to their community and/or to them personally.

<sup>2</sup> **Three Dimensional Learning:** Instruction should be planned to ensure students explicitly utilize science practices (e.g., asking questions, planning and carrying out investigation, designing solutions) and cross-cutting concepts (e.g., cause and effect, patterns, systems and system models) to develop a deep understanding of the core ideas and to understand the relevance to the concepts(s).

<sup>3</sup> **Coherence:** Lessons and units should build on discoveries from prior life experiences and/or background knowledge, student investigations and concepts covered in prior units and, when applicable, prior grade bands.

<sup>4</sup> **ELA/Literacy and Mathematics:** While engaging in the science and engineering practices, students call on the skills of disciplinary literacy in order to make sense of phenomena.