



## **Ignite! Science: Enabling Success For Teachers And Students**

With its full suite of science courseware for middle school, Ignite! offers a multimedia-rich, online learning environment that provides full coverage of science curriculum. The courses are carefully designed to support the best practices of middle school science instruction, taking into account the developmental characteristics of early adolescence, the great variety of students' learning styles and interests, and teachers' needs for an effective and engaging instructional tool.

Ignite!'s science courses include Earth Science, Life Science, and Physical Science. Because states often differ in the content required by their standards, Ignite!'s course materials are easily tailored to meet specific state curriculum needs, including integrated and spiral approaches.

This summary discusses the following elements of Ignite!'s instructional approach:

- Multimedia for a Sound Science Pedagogy – teaching students in the ways they learn best
- The Effects of Science on Society – linking classroom content to the larger world
- Learning By Doing – using inquiry-based experiments to develop scientific skills
- Expectation Failures – creating powerful teaching moments from students' own explanations
- Flexible Implementations – supporting the practical demands of the classroom
- Comprehensive, Research-Based Instruction – providing quantity and quality

### **! Multimedia for a Sound Science Pedagogy**

The nature of science content makes a multimedia approach superior to traditional print-based instructional materials. Ignite!'s narrated animations graphically demonstrate a variety of systems and phenomena, such as why seasons occur and what causes the phases of the moon. Interactive environments that allow students to explore hidden worlds – from the cellular level to the Earth's interior dynamics – give concrete meaning to ideas that would otherwise remain vague and abstract. Videos of natural events and new technologies that students never see in their daily lives help to bring the world into the classroom. The combination of visual, aural, and interactive materials helps students learn concepts faster and more completely than traditional print-based instructional materials.

Ignite!'s multimedia courseware also allows teachers to account for diverse learning styles. Concepts are conveyed through song, poetry, video, animation, interactive diagrams, and many other formats. Then, because each concept is presented through multiple media pieces, each emphasizing a different combination of learning styles, Ignite!'s courseware allows students to find the media piece (or pieces) that speak to how they learn best. Multimedia caters to diverse learning styles much more effectively than traditional print-based instructional materials.

## **! The Effects of Science on Society**

The effects of science on society cannot be overestimated. Yet middle school students often struggle to connect scientific achievements and principles to their daily lives. Presenting science content in terms of the personal and social concerns of teenagers can both increase motivation and enhance learning. Ignite!’s science curriculum does exactly that.

Ignite! Science presents past and current technologies as applications of science designed to meet human needs. This approach helps students discover how scientific progress changes the world in which we live. Evaluating both the positive and negative impacts of scientific progress prompts students to think critically about scientific issues. Similarly, showing how people have different, often conflicting priorities and opinions places science firmly in a social context. Students learn that solutions must be scientifically valid, meet society’s priorities, and strike an appropriate balance between risk and reward.

## **! Learning By Doing**

Learning by doing is generally the most effective educational approach, particularly in science, and Ignite! integrates online inquiry-based experiments for students to apply their knowledge and develop their scientific skills. Whether using a food web to explain how an ecosystem has changed, or searching scenes from the latest action movie for violations of Newton's laws of motion, students evaluate information from many different sources to draw conclusions and defend their findings. By conducting observations, performing simulations, or applying scientific concepts to develop a new technology, students are able to develop proper inquiry techniques such as collecting evidence, interpreting findings, developing cause-effect explanations, weighing positive and negative consequences, making predictions, and communicating results.

## **! Expectation Failures**

All science teachers know that by middle school, students have developed their own explanations about nature and how the world works – but many of these explanations are wrong. Ignite! views these misconceptions not as a weakness for students to be ashamed of, but as a powerful opportunity for learning. Cognitive scientists have shown that when a person’s expectation of what will happen next is not supported by what actually happens, their curiosity is sparked and they are particularly receptive to new information.

These “expectation failures” present a powerful teaching moment. People are surprised to realize that they don’t know as much as they thought they did, and they are eager to correct their mistakes. Ignite! confronts students’ misconceptions about topics such as how natural selection works and what causes things to float. With the integration of expectation failures into media pieces and inquiry-based experiments, student assumptions are challenged and misconceptions are corrected.

## **! Flexible Implementations**

Ignite!'s science courseware is designed to meet the practical demands of the classroom. Depending on their particular needs, teachers have the flexibility to use the courses for whole class instruction, group activities, individual learning, or a combination of these methods. With whole class instruction, teachers use the broadcast capabilities of multimedia to engage all students and create multiple teaching moments. Group activities are used to foster project and collaboration skills, while individual learning allows students to proceed at the pace that best meets their unique needs.

Going well beyond multimedia, Ignite!'s science courseware also incorporates many other features designed to improve – and document – student comprehension and retention. Teachers have the flexibility to assign inquiry-based experiments that allow students to apply their knowledge and develop their scientific skills. Ignite!'s courses also provide built-in assessments that test both simple recall and more advanced thinking skills such as interpreting findings, developing cause-effect explanations, weighing positive and negative consequences, and making predictions. The flexible implementation options, both in how teachers use the courses and the individual components presented to students, allow each teacher to employ Ignite!'s courses in the ways that makes sense for their classrooms.

## **! Comprehensive, Research-Based Instruction**

Science can be a difficult field for students to master. Schools operate under strict accountability requirements that sometimes force teachers to emphasize covering all required material over ensuring that all students master the content. Many educational publishers reflect this shift, focusing on covering all of the standards but forgetting the unique characteristics and needs of the students. Ignite! Science takes a different approach.

Each Ignite! Science course contains hundreds of media pieces and assessments. The treatment of both content knowledge and science skills is based on how middle school students learn best. Ignite! Science provides thorough coverage of standards, while also tailoring the material to the developmental needs and interests of middle school students and the variety of learning styles they possess. As a result of using the Ignite! system, students care more, understand more, and learn more.