

Introduction



It seems that every 3 to 5 years a new idea surfaces in the educational community. The topic has been researched, discussed, and argued in institutions of higher learning; however, when it eventually filters down to the teachers in elementary and high school, there is little time invested in explaining and understanding the new theory - they are told, "Just do it!" The latest educational buzzword is *constructivism*. Teachers are being asked to support this philosophy of teaching and learning, and design instruction accordingly. What does this mean?

This WebQuest will help you go beyond the basic definition of *constructivism: individuals building their own understanding*, to a more thorough explanation of the theory and its various aspects. Examples are provided via the 5 E learning cycle. The 5 E model for designing science lessons is just one method of instruction that supports constructivist teaching/learning. After investigating these resources, you can make your own decision as to the value of the constructivist theory.

The Task



After reading and analyzing a variety of resource materials, you will share an oral presentation with your colleagues to provide a brief historical perspective of this theory and the essential elements of constructivism. As a teacher, you know that the implementation of a new philosophy requires an open mind: identify what you perceive to be some of the advantages and disadvantages of adopting the constructivist approach and present this in a visual format. Finally, use the 5 E model to assist you in designing your own constructivist science lesson.

On-line

[The Practice Implications of Constructivism](#) - This article discusses the implications for teachers when planning constructivist lessons.

[Teaching for Understanding: Educating Students for Performance](#) - Identifies the characteristics of teaching, and classroom changes necessary to implement the constructivist approach. It questions the possibilities of truly seeing a change in practice in the near future.

[Learning Cycle Instructional Model](#) - A nice collection of essays related to constructivist education.

[Constructivism and the Five E's](#) - Mention of individual researchers associated with constructivism and specifics on each stage.

[The ph factor](#) - This site defines the responsibilities of the teacher and students at each stage of the learning cycle.

[5E Model Lessons](#) - This site has some model 5E lessons written in various formats.

The Process



At the completion of this process you will have 3 products: 1) an oral presentation to share with your colleagues, 2) a visual display identifying what you perceive to be the advantages and disadvantages of implementing the constructivist approach, and 3) a science lesson designed using the 5E model.

1. Oral Presentation

- As a lead teacher in your school, your principal has asked you to make a presentation to the faculty on the topic of constructivism.
- Select and read from the resources listed above to gain a thorough understanding of constructivism.
- Write a lecture you will present to your faculty addressing this topic.
- Include some background/historical evidence to support the validity of this theory.
- Be sure to include the essential ideas and various aspects that are important to a constructivist learning environment; time is limited (remember faculty meetings can't run beyond 4pm).

2. Visual Display

- As you gain insight into the constructivist learning theory, you recognize that there are some definite advantages to teaching this way; however, as a teacher already overburdened with a multitude of tasks, you can also

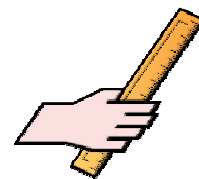
identify some disadvantages to this approach. You feel it is very important to make teachers aware of the pros and cons of this issue and acknowledge that there are some concerns you have. (If you don't recognize this, they will surely point it out to you and use it as an excuse for not trying the approach.)

- Use Inspiration, HyperStudio, or PowerPoint to design a visual presentation of the advantages and disadvantages of using the constructivist approach.
- You may use this as part of your lecture or allow the teachers an opportunity to investigate constructivism and come up with their own list before sharing this with them.
- This can serve as the basis for a brainstorming session or a springboard to identify ways to address the concerns (counteract the perceived disadvantages).

3. Designing a 5E Science Lesson

- Now you have a better understanding of the constructivist philosophy and are ready to give it a try! The 5E model science lesson employs a learning cycle that supports the constructivist approach.
- Review the sites listed in the resource section related to the 5E model; these will provide background information and sample lessons.
- Identify the "big idea" and county indicators that your lesson will address.
- Design your lesson using the 5E model. Make sure you identify appropriate teacher/student roles, strategies, and activities used at each stage to support student learning.
- Remember this is a non-linear process! Formal and informal evaluation occurs throughout.

Evaluation



- Since you are committed to this approach and feel it is important to encourage other teachers in your school to adopt it, you have included it as part of your annual goal.
- Your principal recognizes the time and energy you are dedicating to this project; she has designed a [rubric](#) to assess your performance.

Conclusion



Constructivism is more than individuals building their own understanding. It requires more than active, hands-on learning. It demands teachers and students to take various roles and truly invest in their learning. It requires reflection, interaction, investigation, more reflection and analysis. This approach to learning takes time and recognizes that not everyone is going to be on the same page or even take away the same understanding from a single lesson. This theory acknowledges the complexity of the teaching / learning cycle. You have investigated only one model (5E learning cycle) that supports the constructivist approach:

Do you think this model can be applied to other disciplines?

Can you identify other models or strategies that would support this type of learning?

How does this model address various learning styles?

Rubric for Constructivism and the 5E Model Science Lesson

Aspect being scored	Beginning 1	Developed 2	Accomplished 3
Lecture	Did not mention historical perspective; provided minimum explanation of constructivism.	Provided minimum info on historical background. Discussed the big ideas related to constructivism.	Provided sufficient info on historical background. Discussed the big ideas and included specific aspects related to constructivism.
Visual presentation			
Appearance	Visual is lacking appeal due to typographical errors, inappropriate use of color, or graphics; distracting to viewer.	Visual uses a few colors, fonts, and graphics.	Visual is appealing with appropriate use of color, fonts, and graphics. It complements the presentation and helps it to flow.
Organization	Presentation is disorganized.	Presentation has basic	Presentation is well organized and

	cluttered, and difficult for the user to follow.	organizational scheme, but may be misleading for some users.	easy to follow. Good use of graphics/color to enhance flow of info.
Content	Identifies broad, general issues not specific to constructivism.	Identifies a few basic issues related to constructivism.	Analysis of info evident by the identification of valid issues and specific aspects related to the constructivist approach.
5E Science Lesson			
Ideas & Indicators	Did not identify "big idea" and indicators appropriate for lesson.	Missing either "big idea" or indicators for lesson OR they do not match the lesson content.	Identifies "big idea" and indicators appropriate for lesson.
Engagement/Excite	Missing two or more of the following components: captures students' attention, accesses prior knowledge, and identifies appropriate activities.	Missing one of the following components: captures students' attention, accesses prior knowledge, and identifies appropriate activities.	Addresses all components of this stage: captures students' attention, accesses prior knowledge, and identifies appropriate activities.
Exploration	Missing 3 or more components of this stage: student centered, teacher as guide, interactive, inquiry based, direct concrete experiences with the concept.	Missing 2 components of this stage: student centered, teacher as guide, interactive, inquiry based, direct concrete experiences with the concept.	Addresses all components of this stage: student centered, teacher as guide, interactive, inquiry based, direct concrete experiences with the concept.
Explanation	Missing 3 or	Missing 2	Addresses all

	more components of this stage: teacher and students work together, analysis of info from exploration, teacher clarifies info and shares scientific terminology, concept is formed.	components of this stage: teacher and students work together, analysis of info from exploration, teacher clarifies info and shares scientific terminology, concept is formed.	components of this stage: teacher and students work together, analysis of info from exploration, teacher clarifies info and shares scientific terminology, concept is formed.
Extension/Expansion/Elaboration	Missing 2 component of this stage: student centered, active learning, activities to deepen understanding of concept OR apply to a real world situation.	Missing one component of this stage: student centered, active learning, activities to deepen understanding of concept OR apply to a real world situation.	Addresses all components of this stage: student centered, active learning, activities to deepen understanding of concept OR apply to a real world situation.
Evaluation	Lacking means to evaluate or inappropriate tool identified.	Evaluation conducted only at end of lesson.	Appropriate formal and informal evaluations are identified throughout lesson.

Print

Brooks, J.G. & Brooks, M. (1993). *The Case for Constructivist Classrooms*. VA: ASCD. This book provides a background for constructivist education and uses real life classroom examples.

Educational Leadership, February 1994 Issue. This journal focuses on one topic each month; this month includes many articles related to constructivism. It raises questions and provides practical suggestions.

Gardner, H. (1991). *The Unschooled Mind: How Children Think and How Schools Should Teach*. NY: Basic Books. This book shares research on the optimum methods of teaching so students can learn.