Teaching Channel
With Learners Edge

Your Education Ally.

By Teachers, *For Teachers.*

Course Syllabus

Name:
Date:

TeachingChannel.com | 1-(877) 394-4930
2805 Dodd Rd. Eagan, MN 55121

Teaching Channel
With Learners Edge

Today is a Great Day to Learn Something New!

Professional learning to meet your needs.

Engaging and applicable, ELEVATE courses are the core of Teaching Channel. We offer a variety of courses that meet the continuing education needs of teachers from across the country. Teaching Channel courses work perfectly for license renewal needs, working to move up through salary schedules, or for professional learning to support improved student outcomes.
Teaching Channel provides continuing education graduate credit courses that have been approved and endorsed by regionally accredited colleges and universities from across the United States.

Current University Partners (See a current list of academic partners on our website)
Continuing Education courses are approved by our regionally accredited (HLC, NECHE, WSCUC, NWCCU) partners by review of syllabi, content, and coursework expectations.
(Indicate anticipated university/college partner below, if applicable.)

Course Creation and Evaluation:

Courses are created and evaluated by educators with a master's degree or higher in an education-related field and five or more years of classroom experience in PreK-12th grade education. Course evaluators provide personalized, specific feedback for assignments and rubric-based grading aligned with best practices in professional education.

Spring Term	Summer Term	Fall Term
Registrations Accepted	Registrations Accepted	Registrations Accepted
July 16-March 15	December 16-July 15	March 16-October 22
Coursework Due*	Coursework Due*	Coursework Due*
April 15	August 15	November 15

*Or first business day after the 15th if due date falls on a weekend.

Coursework Details

The Rigor of Teaching Channel Graduate-Level, Continuing Education Courses.

Professional Learning Model

Our research-based Professional Learning Model is used to design ELEVATE continuing education courses. The model includes five elements used to guide professional learning and to positively impact student outcomes:

Course Content

ELEVATE Courses are self-paced, and per standard practice in the field, each credit carries the equivalent of fifteen hours of content and coursework. Participants explore resources that include a solid balance of research and applicability. All courses feature video clips, research-based articles, and interactive elements to enhance and support learning. To receive credit, participants must complete the following requirements according to expectations outlined in our course rubric:

Response Questions: Connect new learning from course resources to current pedagogy.

Resource Review: Find resources related to the course topic to extend learning and solve problems of practice.

Applications: Complete a variety of assignments encouraging participants to implement new learning in their classrooms or schools.

Reflection: Write a reflection paper that activates critical thinking and inspires the transformation of future professional practice.

All coursework is to be completed in the Teaching Channel online environment.

Course Name	Empowering Engagement Strategies in Science
Course Number	OL 5537
Course Credits	3 or Flex Credit

NOTE: This syllabus is an outline of the course requirements and is subject to change; the coursework will be completed and submitted in the online environment where you will have full access to a variety of media, links, and other online tools required to satisfactorily complete this course.

Course Description:

Empowering Engagement Strategies in Science equips you with the knowledge and skills to engage students in science education. This course is designed to help educators identify shifts to student-centered science instruction using the Next Generation Science Standards (NGSS) frameworks. Brainstorm teaching ideas within the 5E framework to create dynamic lesson plans that engage and inspire. Apply an active learning approach to a current science lesson or unit and design activities that teach students a collaborative skill. You will also set a goal to improve equity in science lessons to serve all students. Get ready to take your science teaching skills to the next level!

Course Objectives:

1. Use prompts about engagement and active learning in science instruction to describe assumptions and insights of practitioners, researchers and self, including how the information relates to professional education practice and growth.
2. Identify shifts to student-centered science instruction using the Next Generation Science Standards (NGSS) frameworks.
3. Brainstorm teaching ideas within the 5E framework.
4. Apply an active learning approach to a current science lesson or unit.
5. Design an activity to teach students a collaborative skill.
6. Set a goal to improve representation in science lessons designed to inspire all students.

Required Reading:

All articles and other resources are linked in the online environment, within their respective assignments.

All coursework is to be completed in the Teaching Channel online environment.

Knowledge Base:

Knowledge base, in part, is affirmed in the writing and research of these references:

Frey, N., Ortega, S., Fisher, D., & Hattie, J. (2023). *Teaching Students to Drive Their Learning: A Playbook on Engagement and Self-Regulation, K-12*. Corwin Press.

Magana, S. (2022). *Learning in the Zone: The 7 Habits of Meta-Learners*. Dave Burgess Consulting, Incorporated.

Miller, J. J. (2020). *Student-Centered Classroom: Transforming Your Teaching and Grading Practices (a Guide for Student-Centered Learning Through Interactive Teaching Practices and Individualized Assessment)*. Solution Tree Press.

Porosoff, L. (2023). *Teach for Authentic Engagement*. ASCD.

Pugh, K. J. (2020). *Transformative Science Education: Change How Your Students Experience the World*. Teachers College Press.

Slykhuis, D., Asim, S., Trumble, J., & Ellis, J. (Eds.). (2023). *Theoretical and Practical Teaching Strategies for K-12 Science Education in the Digital Age*. IGI Global.

Stroupe, D. (2023). *Growing and Sustaining Student-Centered Science Classrooms*. Harvard Education Press.

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Teaching Channel Course Rubric

All course submissions must meet general graduate level standards through the use of correct grammar, spelling, and mechanics. Each paragraph should be clearly organized and include 5 sentences or more. If work does not meet the above criteria, it will be returned to the student for resubmission.

Rubric	A Grade = Outstanding Performance	B Grade = Target Performance	Below Target Performance
Statement of Intention and Awareness	The evaluator will only review the Statement of Intention and Awareness for a response to each prompt. If a student does not respond to each prompt, the Statement will be returned to the student for resubmission. The student's Statement of Intention and Awareness will be evaluated as part of the Reflection.		
Investigation: Read and Respond	Coursework thoroughly and accurately addresses all question components by summarizing key concepts from readings. In at least half of the responses, the participant also makes inferences related to professional practice or supports answers with professional experiences.	Coursework thoroughly and accurately addresses all question components by summarizing key concepts from readings.	Coursework will be returned to student for resubmission with evaluator instructions if it does not meet target performance.

All coursework is to be completed in the Teaching Channel online environment.

Investigation: Resource Review Rubric	A Grade = Outstanding Performance	B Grade = Target Performance	Below Target Performance
Summary of Resource	Coursework summarizes the main ideas presented in the resource and includes at least one instance of critical analysis (i.e. asks questions, looks for gaps in information, disputes contradictions, etc.)	Coursework summarizes the main ideas presented in the resource.	Coursework will be returned to student for resubmission with evaluator instructions if it does not meet target performance.
Relation to Personal Assumptions or Course Content	Coursework provides more than one detailed example of how the resource supports or challenges personal assumptions and/or course content.	Coursework provides one example of how the resource supports or challenges personal assumptions and/or course content.	Coursework will be returned to student for resubmission with evaluator instructions if it does not meet target performance.
Impact on Professional Practice	Coursework provides more than one clear explanation of how the information in the resource could impact professional practice.	Coursework provides one explanation of how the information in the resource could impact professional practice.	

All coursework is to be completed in the Teaching Channel online environment.

Application Rubric	A Grade = Outstanding Performance	B Grade = Target Performance	Below Target Performance
Planning, Development and Execution	Coursework shows complete planning, development and/or execution of application, clear articulation of details and inclusion of polished required artifacts.	Coursework shows complete planning, development and/or execution of application and inclusion of required artifacts.	Coursework will be returned to student for resubmission with evaluator instructions if it does not meet target performance.
	Coursework includes creative or innovative application of new knowledge and skills from course content to professional practice.	Coursework includes application of new knowledge and skills from course content to professional practice.	
Written Requirements	Coursework provides clear, logical, and organized responses to any writing prompts in the application. It also includes at least one detailed connection to course objectives, student learning goals or transformation of professional practice.	Coursework provides clear, logical, and organized responses to any writing prompts in the application.	

All coursework is to be completed in the Teaching Channel online environment.

Reflection Rubric	A Grade = Outstanding Performance	B Grade = Target Performance	Below Target Performance
Connection to Statement of Intention and Awareness	Coursework includes an evaluation of both learning goals articulated in the participant's Statement of Intention and Awareness from Module 1. Participant includes one future learning goal related to course content.	Coursework includes an evaluation of one of the learning goals articulated in the participant's Statement of Intention and Awareness from Module 1.	Coursework will be returned to student for resubmission with evaluator instructions if it does not meet target performance.
Summary of Learning	Coursework includes three or more detailed connections to specific assignments completed or course content viewed (assigned readings or videos).	Coursework includes two general connections to course content.	
Description of Positive Influence or Transformation	Coursework includes two or more specific ideas for changes in one's professional practice with timelines. OR Coursework includes two or more detailed action steps with timelines for positively impacting other stakeholders.	Coursework includes one general idea for changes in one's professional practice. OR Coursework includes one action step for positively impacting other stakeholders.	

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Module 1

1. Tell us about yourself!

Before we begin with course content, write 1 sentence about yourself. You will be asked to include this background in each of the modules submitted for the course. This provides context for your responses and enables the course evaluator to respond with feedback tailored to your specific role in education. Here are three examples to guide you:

- I'm a 4th grade teacher and teach all subjects.
- I'm a middle school counselor.
- I'm out of the classroom on leave this year, but next year I'll be back teaching 9th grade science.

2. Statement of Intention and Awareness

At Learners Edge, we want your learning to be purposeful and applicable to your professional practice. To do that, research says learners need to first identify their motivations and goals. Next, learners assess prior knowledge and previous experiences so they can create deeper connections to the course material.

Using the guidelines below, please address the following in your Statement of Intention and Awareness, in a total of two paragraphs, or more:

1. Share your motivation for learning about engagement and active learning in the sciences.
2. Summarize your previous knowledge or experience with engagement and active learning in the sciences.
3. List your own two learning goals for the course.

In Module 1, your evaluator will review your Statement of Intention and Awareness to ensure it is complete. It will be graded within your Reflection Requirement in Module 3, where you'll revisit your Statement of Intention and Awareness to identify your growth and learning from the beginning of the course to the end.

3. Application: Evolution of Science Instruction

Science instruction in the 2020's has evolved considerably in recent years. looks When you think back to your science education in school, consider *how* you learned, and *who* you learned from. Take a look at this infographic, from the National Science Teaching Association. (*Click the image to view as a PDF file.)*

You will likely notice phrases like, "analyzing and discussing data," "planning and carrying out investigation," and "presenting models." Next, read through this infographic for the rationale for student-centered, active learning in science. (*Click the image to view as a PDF file.)*

If you have not had experience working with the NGSS, please read the following explanation in Science Teacher, by Ravit Golan Duncan and Veronica L. Cavera, "DCIs, SEPs, and CCS, Oh My!" Whether or not you have implemented the NGSS, you can see the shift in focus through the following chart that focuses on innovative strategies:

All coursework is to be completed in the Teaching Channel online environment.

Table 1: Innovation 1—Making Sense of Phenomena and Designing Solutions to Problems

Instructional materials programs designed for the NGSS include:

Less	More
Focus on delivering disciplinary core ideas to students, neatly organized by related content topics; making sense of phenomena and designing solutions to problems are used occasionally as engagement strategies, but are not a central part of student learning.	Engaging all students with phenomena and problems that are meaningful and relevant; that have intentional access points and supports for all students; and that can be explained or solved through the application of targeted grade-appropriate SEPs, CCCs, and DCIs as the central component of learning.
Making sense of phenomena and designing solutions to problems separated from learning (e.g., used only as an engagement tool to introduce the learning, only loosely connected to a disciplinary core idea, or used as an end of unit or enrichment activity).	Students using appropriate SEPs and CCCs (such as systems thinking and modeling) to make sense of phenomena and/or to design solutions to give a context and need for the ideas to be learned.
Instructions for students to "design solutions" as a step-by-step directions-following exercise.	Students learning aspects of how to design solutions while engaged in the design process.
Only talking or reading about phenomena or how other scientists and engineers engaged with phenomena and problems.	Students experiencing phenomena directly or through rich multimedia.
Leading students to just getting the "right" answer when making sense of phenomena.	Using student sense-making and solution-designing as a context for student learning and a window into student understanding of all three dimensions of the standards.

Image from *Next Generation Science Standards, Innovations and Instructional Materials*, pg. 4

In best practices for Science instruction, the message remains clear: students are driving their own learning using a variety of skills and activities, which makes their learning richer, deeper, and more relevant.

To complete this assignment:

- Please watch one or more videos in this playlist. *Please note: videos 1 and 2 do not show NGSS in action.*
- As you watch, look for examples of student discovery, teacher facilitation, and student-driven engagement and learning.
- After watching the video(s), write a 2 paragraph or more summary of what you saw that demonstrated student engagement and learning, and how the practices in the video were geared toward student discovery. Include your thoughts about including teacher moves or strategies to support student learning.

Submit your 2 paragraph or more summary with your Module submission. If sharing a link, be sure the share settings are set to, "anyone with the link can view."

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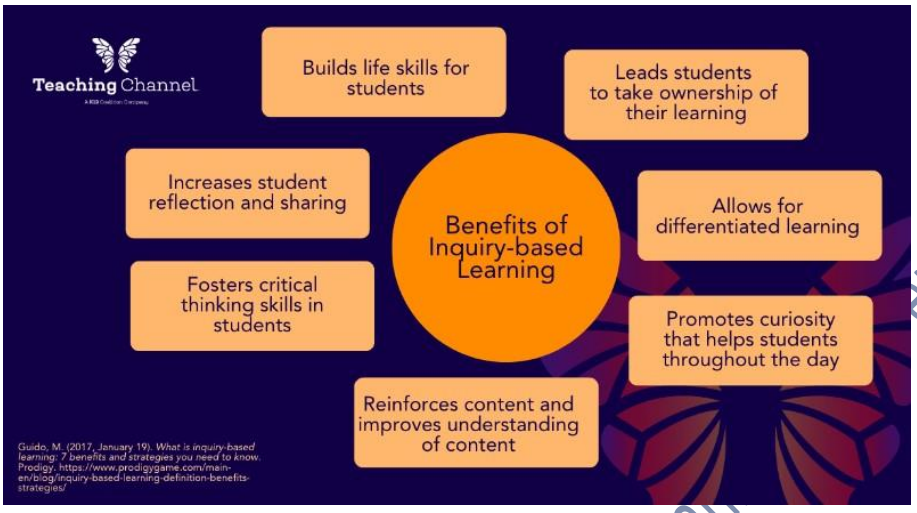
4. Application: The 5 E's

Inquiry-based learning is another way to engage students in their science learning. Take a look at the benefits of inquiry-based learning for students:



Science instruction - with or without inquiry - work best when activities and lessons are planned using the 5E's framework, shown below:

Image from San Diego County's Office of Education

Please read, "5E Model of Instruction," from San Diego County's Office of Education to learn more. Be sure to focus on the explanations for each of the 5E's.

Next, select a topic in your science curriculum (or choose one of the lessons from the NGSS Quality Examples) that is not currently in the 5E format.

Download and complete our Brainstorming Template by jotting down 2 or more ideas for each of the E's, based on your topic. Please use complete sentences so we can better understand your thoughts.

Submit the completed template with your Module submission. If sharing a link, be sure the share settings are set to, "anyone with the link can view."

Module 2

1. Tell us about yourself!
Provide a one sentence or longer explanation of your role in the field of education.

2. Application: Active Learning
Science learning best practices are about active learning that engages students, putting students in the driver's seat of their learning by discovering and applying learning.

To explore more about active learning, please read and review the following resources:

- Read, "The Art and Science of Active Learning," from Post University, providing strategies, techniques, and rationale for active learning.
- Purdue provides additional resources to support active learning.
- Meg Richard of Teaching Channel writes, "Active Learning: A Strategy for Science Sensemaking," with fantastic ideas!
- Our youngest learners are some of the best experimenters in science! Read, "What is Active Learning in Early Childhood," from EDGE Early Learning.
- Watch this video about play-based learning as an active learning strategy.
- Still a fan of the lecture? Read, "Using Mini-Leactures to Create Active Learning Space," by Todd Zakrajsek at the University of North Carolina at Chapel Hill.
- Finally, read about a few more active learning techniques from Cornell University.

Complete the following steps for this application:

A. Review this chart, comparing active learning with passive learning, and think about one of your science units or lessons using passive learning strategies.
B. Consider how you can update the passive learning strategy to an active learning strategy you've learned about from the resources.
C. In two paragraphs or more, describe how you will implement an active learning strategy to replace a passive one in your science instruction. Be sure to include the following in your response:
    - Why you chose the active learning strategy you did
    - Your hopes for improved learning and understanding in this unit or lesson
    - How you might switch out additional active learning strategies in your teaching.

Submit your response with your Module coursework. If sharing a link, be sure the share settings are set to, "anyone with the link can view."

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3. Application: Collaborative Learning

As Carl Sagan notes above, collaboration is key when it comes to science. The resources you read earlier list collaboration as an active learning strategy, and we know that deeper learning occurs when students collaborate. "Why is Collaboration Important in Science?" from Collaboratory has insights you can share with your learners!

In addition, it's imperative we teach students how to collaborate productively. Anna Sudderth's, "Five Ways Educators Can Teach Collaborative Learning to Students," has great guidance to ensure students excel at this skill.

For this application, you will be designing a collaborative learning activity for your students as part of your science instruction: group work, a discussion, or another great strategy from the resources! Before you get started, please review the following resources:

- "Five Collaborative Learning Strategies for STEM Learning," from Imagine Learning, offers ideas for collaboration beyond small groups.
- "Leading a Discussion," from the TeachingWorks Resource Library shares ways students can collaborate through discussion. Be sure to look at the curriculum resources!
- "Talking the Talk: Engaging Your Students in Scientific Discourse," by Alissa Berg, Teaching Channel
- Watch Ms. Cope's 2nd graders collaborate in science class
- See how these 12 graders collaboratively engineering a bridge

To apply your learning, develop a 30 minute activity for your students to learn a collaborative process (leading a discussion, problem solving), or how to enhance their collaboration skills. Remember, it's best if the activity is student-led or driven! Be sure to include the following:

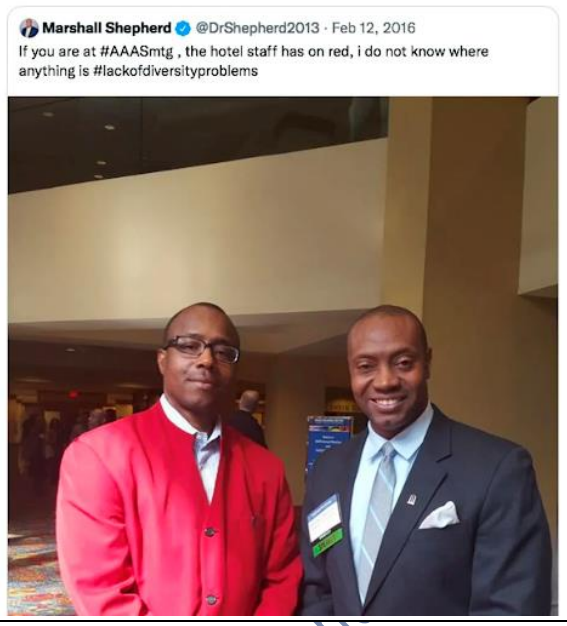
- Objective
- Grade level
- Step by step procedure for the activity
- Directions for students collaborate with others
- Plan for implementation (when, how)

Submit your activity plan with your Module coursework. If sharing a link, be sure the share settings are set to, "anyone with the link can view."

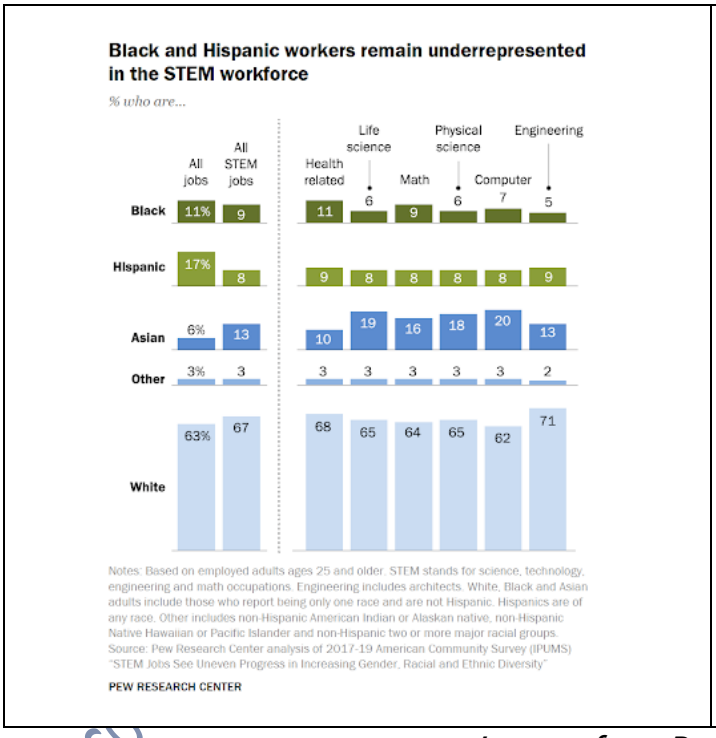
4. Application: Representation

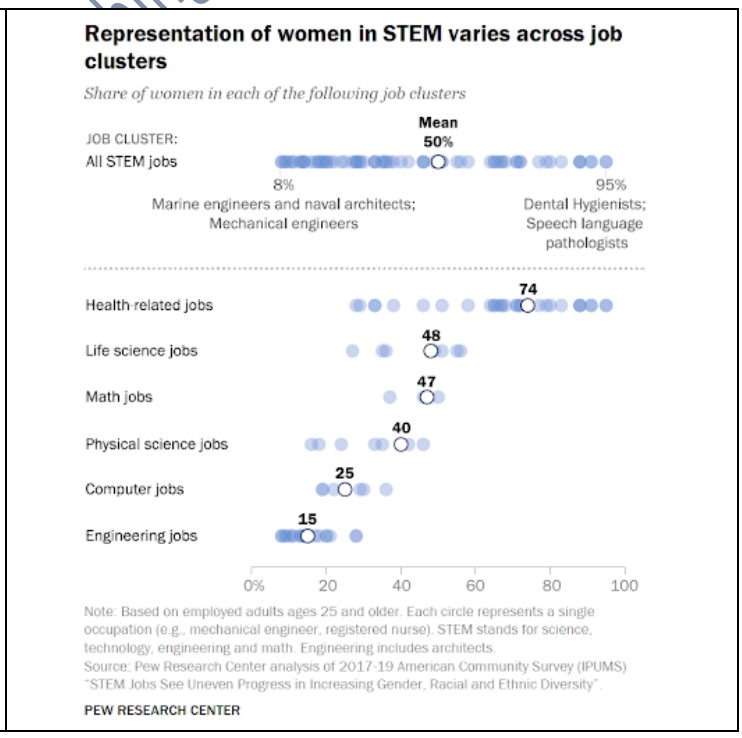
In, "Lessons from a Mermaid About Representation in Science and Engineering," author Marshall Shepherd writes,

All coursework is to be completed in the Teaching Channel online environment.

"Over the course of my career, I have been told several times that [I] 'don't look like a scientist,'" and as a featured lecturer at a major science conference, "I was wearing a suit and was one of only a few Black scientists there. Numerous people asked me if I was hotel staff or questions as if I was. It got so bad that I asked a staff member to take a selfie with me.	

Statistics from the Pew Research Center tell the story: there remains a lack of underrepresented groups, including women, in STEM fields.





Images from Pew Research Center

To inspire a new generation of innovators, representation matters, so *all students* can see themselves as a scientist, mathematician, engineer, and/or technologist. If students see that people who look like them can achieve a career in science, they will engage with the work. Enthusiastically!

Read the following articles about equity and inclusion, then complete the assignment that follows.

- "A Troubling Lack of Diversity in Educational Materials," by Amanda Armstrong, provides ideas for teachers to ensure representation of their instructional materials.
- "Science Has a Diversity Problem. For the Sake of Our Students, We Have to Change the Narrative," by Geoffrey Carlisle has strategies for addressing equity and inclusion.
- "The STEM Gap: Women and Girls in Science, Technology, Engineering, and Mathematics," contains research from AAUW.
- Aside from smashing their goal of 100k new STEM teachers in 10 years, the organization, Beyond 100K, focused on improving equity in high school STEM. Here's what they did.

Optional: Read Bailey's story about how her upbringing as a Shoshone Bannock tribal member influenced her love of science.

Now, to put your learning into action, please create a SMART Goal for addressing equity and inclusion in your science teaching by using our template. Be sure to consider how you can increase engagement through representation.

Submit your completed template with your coursework submission. If sharing a link, be sure the share settings are set to, "anyone with the link can view."

5. Investigation: Resource Review

To complete the Resource Review, identify two resources related to (but not directly from) the course content to enhance your professional practice, and deepen your understanding of the course content.

Resources may include blog posts, podcasts, websites, videos, documentaries, films, articles, books, or journals, published within the last five years. To find a resource, we suggest a web search (Google) using terms or ideas from the course you'd like to learn more about, or that relate to your specific professional learning needs.

Please provide the resource title, author, copyright or publishing date, and URL (if applicable). Then, in two paragraphs or more per resource, respond to one or more of the following:

- Share information about how the resource information could impact your professional practice
- Explain how each resource supports or challenges your professional assumptions
- Summarize any questions that remain, i.e.: gaps in information or contradictions

To meet "A" criteria as outlined in the course rubric, for each resource, include two or more different examples of how the resource supports or challenges assumptions, *and* explain two ways this resource will impact your professional practice.

All coursework is to be completed in the Teaching Channel online environment.

Module 3

1. Tell us about yourself!
Provide a one sentence or longer explanation of your role in the field of education.

2. Application: Synthesis
Professional learning is essential for teachers to continue growing and improving their practice. Now, it's time to put your learning into action with a culminating project. This project is an opportunity for you to utilize the knowledge and skills you've acquired throughout the course to create something practical for your classroom or school. Teaching Channel wants you to culminate this course through an assignment that's relevant, applicable, and useful. Please select and complete one of the following options:

Option A: Plan an Initiative
Develop a plan to incorporate a paradigm shift, a specific educational model or a growth initiative into your classroom, on your team, or in your building. You may use Google Slides, Google Docs (for a narrative)—whatever works best for you. Please include each of the following in your 2 page or more plan:

1. Goals – what will the end results be?
2. Allies and Resources – who and what could help you reach your goals?
3. Communication – how will you engage with all stakeholders
4. Roadblocks and possible solutions
5. Timeline for implementation

Please submit your plan with your coursework submission.

Examples:

- Create a plan to improve student engagement in the school's science programming.
- Create a program for new teachers in your district about active learning, or inclusion and equity in science.
- Revamp your school's method of approaching science.

Option B: Design a Presentation
Create a 30 min or more presentation for an audience of your choice, based on your learning in this course. Please include the following in your presentation:

1. One slide identifying your audience and how the presentation will benefit the group
2. Three or more concepts or ideas to be addressed in the presentation
3. Speaker notes embedded in the slides (or in a separate document)
4. One or more interactive activity (e.g. discussion prompt, jigsaw, gallery walk)
5. An explanation of next steps, such as additional trainings, resources, and/or collaborations

Please submit your presentation with your coursework submission.

Examples:

- Explain the rationale for implementing engagement strategies in science instruction.
- Rally your science colleagues to get excited about active learning in science.
- Introduce your colleagues to the 5E framework.

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Option C: Develop a Unit of Study

This option presents you with the opportunity to significantly enhance an existing unit of study or create a brand new one, comprised of 5 or more lessons. For this option:

1. Describe the student goals/objectives of the unit
2. Using our template, please include enough detail to ensure full understanding of the program or unit of study. Could a colleague teach this from your explanation, without preparation from you?
3. Embed links to lesson resources (e.g. websites, videos, readings) within the template
4. If you are revising an existing unit, please describe the areas you've enhanced or extended the original lesson(s)

Please submit your template with your coursework submission.

Examples:

- Incorporate new strategies into an existing unit plan used with your students
- Create a new student group addressing issues pertaining to your learning
- Recommendations for improvement regarding an existing program in your school or district

5. Reflection

In 2 or more double-spaced pages (12pt font), synthesize your learning by summarizing how your learning in this course has evolved your professional practice. To meet "A" criteria as outlined in the course rubric, your reflection should include:

- A comparison of your learning goals from your Statement of Intention and Awareness in Module 1 with your new learning, to assess how you've grown.
- One key takeaway from your learning.
- One future learning goal related to course content.
- Three or more detailed connections to specific course applications, information from readings, and other completed course activities.

And your choice of *one* of the following:

- Two or more specific ideas for changes to your professional practice with timelines for implementing changes.
- Two or more detailed action steps you'll take to positively influence others (students, parents, colleagues, administrators, community members, etc.), including implementation timelines.

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