

6-12 SCIENCE INSTRUCTIONAL MODELS

LEARNER-CENTERED MODEL

OVERVIEW: This model focuses on student voice, choice, flexibility, as well as deeper approaches to learning such as inquiry, engineering design process, project-based learning, and design thinking. Students may focus on processing moods, emotions, feelings, and current events using physical activity and creative thinking.

TEACHER PLANNING GUIDANCE

Teachers will provide guidance to students as they work through developmentally-appropriate opportunities to engage with relevant and meaningful phenomena and/or design challenges that build towards learning goals.

Prior to selecting a meaningful phenomena for students to explore, teachers should identify the specific required content that has not been taught and develop learning opportunities to address the missing content. Teachers may utilize the [Oregon Science Standards](#) and district curriculum guides to assist with determining which standards students have had sufficient exposure and experience with prior to a school closure.

SUGGESTED STRATEGIES

The learner-centered pathway allows for higher levels of inquiry and student autonomy as they build conceptual understanding and work individually and/or collaboratively to complete research, projects or design challenges. Students may need guidance on project planning and guidance on time and task allocation.

Incorporate different asynchronous, synchronous learning, and non-tech based learning support.

- [Distance Learning for All: Care, Connection, Continuity](#) (Offers guidance and requirements)
- Create a network of support for students that allows differentiation and meets their learning needs (Teacher, peers, and other educators) [ODE Special Education](#), [ODE TAG](#), [ODE English Learners \(page 18\)](#)
- Teacher generated modules and/or packet support
- Textbook and online resources (simulations, WebQuests, scientific literature, etc.)
- Provide consistent and timely feedback to students and provide opportunities for them to work collaboratively through the use of tools such as:
 - Video Conferencing ([Google Meet](#), [Zoom](#), etc.)
 - Telephone calls and email
- Collaborative platforms (Google, [Padlet](#), [Flipgrid](#), etc.)

SAMPLE WEEKLY SCHEDULE

(Maximum science instruction is 2.5 hours/week.)

Learning time is 30 minutes daily. Note that projects may span multiple weeks.

Note: Daily and weekly schedule times and activities are recommendations; however, teachers, students, and families should work together to adapt schedules and activities to meet individual needs.

Monday:

Office hours with the teacher. Feedback/support should be provided to students throughout the process as needed.

- The teacher introduces parameters of the project, essential questions, outlines standards/content to be covered and performance expectations of the project/design challenge. Ancillary materials should be included at this time.
- Team projects: students work collaboratively to determine questions or define problems based on the project parameters, determine and distribute tasks, determine a schedule for completing tasks, and provide opportunities for group discussion.
- Individual project: The student determines questions or problems to address within the parameters of the assigned project, determines steps toward completion of the project, and constructs a timeline for completion.

Tuesday:

- Submit a project plan to the teacher. Begin work individually and/or collaboratively to complete the project.

Wednesday-Thursday:

- Work individually and/or collaboratively to complete projects.

Friday:

- Team/Individual project reflection submitted to the teacher. Include questions, concerns, successes, and



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<ul style="list-style-type: none">● Shared Google documents of common questions and teacher responses● Office hours using multiple communication channels, as appropriate.● Provide students with a collaborative learning space● Self and Peer Assessment: Encourage student reflection and collaboration for formative assessments.	<p>challenges.</p> <ul style="list-style-type: none">● The teacher would use these reflections the following week during office hours to provide feedback to students.● Teachers would use this feedback to determine additional ancillary support needed by individuals or students to support learning.
<p>RESOURCES</p> <ul style="list-style-type: none">● 6-8 Online Resources - Oregon Open Learning resources● 9-12 Online Resources - Oregon Open Learning resources● Oregon Open Learning - additional resources● Citizen Science: Provides opportunities for students to engage in real-world investigations and explorations.● Students Learning Science at Home - Explore the world around you, understand natural phenomena, and solve engineering problems from your own home.● STEMTeachingTools - Tools that can help you teach science, focused on supporting the teaching of the Next Generation Science Standards (NGSS).	

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TEACHER-CENTERED MODEL

OVERVIEW: This model is used to teach specifically to the standards. Instruction takes the form of direct instruction, then demonstration of skills or concepts in a mode directed by the teacher. Skills and concepts covered using this model could then be used flexibly in a student-centered approach.

TEACHER PLANNING GUIDANCE

Teachers will provide guidance to students as they work through developmentally-appropriate opportunities to engage with relevant and meaningful phenomena and/or design challenges that build towards learning goals.

Prior to selecting a meaningful phenomena for students to explore, teachers should identify the specific required content that has not been taught and develop learning opportunities to address the missing content. Teachers may utilize the [Oregon Science Standards](#) and district curriculum guides to assist with determining which standards students have had sufficient exposure and experience with prior to a school closure.

SUGGESTED STRATEGIES

The teacher-centered pathway uses confirmation and structured inquiry as students apply content to assigned coursework. The role of the teacher in this pathway is to provide direct support for students to explore phenomena and/or a design challenge, and the science and engineering processes. Students create work products that are shared largely between themselves and their respective teachers.

Implement a weekly approach to planning instruction to include learning guidelines and outcome rubrics (if applicable)

Allow student choice in scheduling individual learning times to meet weekly learning expectations outside of scheduled synchronous learning opportunities.

Provide consistent weekly communication including feedback on student work.

- [Distance Learning for All: Care, Connection, Continuity](#) (Offers guidance and requirements)
- Create a network of support for students that allows differentiation and meets their learning needs (Teacher, peers, and other educators) [ODE Special Education](#), [ODE TAG](#), [ODE English Learners \(page 18\)](#)
- Shared Google documents of common questions and teacher responses
- Teacher generated modules and/or packet support
- Textbook and online resources (simulations,

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(Maximum science instruction is 2.5 hours/week.)

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Monday:

Office hours with the teacher. Feedback/support should be provided to students throughout the process as needed.

- The teacher provides content (synchronous or asynchronous) and instructional expectations and essential question(s) for the week (Video, lecture/reading, PPT-Interactive Notes, etc).
- Synchronous or asynchronous content may be continued through the week as the teacher deems appropriate to support student learning.

Tuesday:

Students engage in individual exploration of the content through teacher-provided materials.

Wednesday - Thursday:

Students individually work on the teacher assigned products using content provided through synchronous and asynchronous instruction.

Friday:

Students submit products or reflections as described in teachers' weekly expectations. Teachers should provide timely and relevant feedback to students.



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WebQuests, scientific literature, etc.)

- Provide consistent and timely feedback to students through the use of tools such as:
 - Video Conferencing ([Google Meet](#), [Zoom](#), etc.)
 - Telephone calls and email
- Office hours using multiple communication channels, as appropriate.
- Include materials and instruction that can be viewed by students asynchronously or without digital resources.
- Self-Assessment: Encourage student reflection and collaboration for formative assessments.

RESOURCES

- [6-8 Online Resources](#) - Oregon Open Learning resources
- [9-12 Online Resources](#) - Oregon Open Learning resources
- [Oregon Open Learning](#) - additional resources
- [Sample Learning Menu](#) - options that depend on low or no technology that focus on students' interests and the world around them
- [STEMTeachingTools](#) - Tools that can help you teach science, focused on supporting the teaching of the [Next Generation Science Standards \(NGSS\)](#).

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HYBRID MODEL

OVERVIEW: This model is a happy medium between the two approaches above. Instruction in this pathway may take the form of menus, activity calendars, and more in order to offer choices and options for students and families based on student interest and available resources.

TEACHER PLANNING GUIDANCE

Teachers will provide guidance to students as they work through developmentally-appropriate opportunities to engage with relevant and meaningful phenomena and/or design challenges that build towards learning goals.

Prior to selecting a meaningful phenomena for students to explore, teachers should identify the specific required content that has not been taught and develop learning opportunities to address the missing content. Teachers may utilize the [Oregon Science Standards](#) and district curriculum guides to assist with determining which standards students have had sufficient exposure and experience with prior to a school closure.

SUGGESTED STRATEGIES

The hybrid pathway allows for a balance between student and teacher-centered learning approaches of instruction and employs different levels of inquiry as appropriate. This pathway provides a foundation of support provided by the teacher with opportunities for students to explore phenomena and/or design challenges in the completion of individual and/or group projects and challenges. Students may need guidance on project planning and guidance on timelines and task allocation.

Incorporate different asynchronous, synchronous learning, and non-tech based learning support.

- [Distance Learning for All: Care, Connection, Continuity](#) (Offers guidance and requirements)
- Create a network of support for students that allows differentiation and meets their learning needs (Teacher, peers, and other educators) [ODE Special Education](#), [ODE TAG](#), [ODE English Learners \(page 18\)](#)
- Teacher generated modules and/or packet support
- Textbook and online resources to include simulations, WebQuests, and scientific literature.
- Provide consistent and timely feedback to students and provide opportunities for them to work collaboratively through the use of tools such as:
 - Video Conferencing ([Google Meet](#), [Zoom](#), etc.)
 - Telephone calls and email
- Collaborative platforms (Google, [Padlet](#), [Flipgrid](#), etc.)

SAMPLE WEEKLY SCHEDULE

(Maximum science instruction is 2.5 hours/week.)

Learning time is 30 minutes daily. Note that projects may span multiple weeks.

Note: Daily and weekly schedule times and activities are recommendations; however, teachers, students, and families should work together to adapt schedules and activities to meet individual needs.

Monday:

Office hours with teacher feedback/support should be provided to students throughout the process as needed.

- The teacher introduces the unit overview or weekly agenda including assignments, essential question(s), and project guidelines.
- The teacher provides instructional delivery of content. This may be done online (synchronous or asynchronous) or through informative packets.

Tuesday-Thursday:

Students engage in individual or collaborative exploration of the content through teacher provided materials. The teacher provides ongoing instruction as well as feedback to students on all tasks completed and submitted.

- Team projects: Students work collaboratively to determine and distribute tasks, roles in completing tasks, and to schedule opportunities for group discussion.
- Individual projects: Student determines steps toward completion of the project, and constructs timeline for completion.

Friday:

Students submit work to the teacher based on expectations in the weekly agenda.

- Students will continue to work independently and/or collaboratively on projects and assigned work.

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- Shared Google documents of common questions and teacher responses
- Office hours using multiple communication channels, as appropriate.
- Provide students with a collaborative learning space
- Include materials and instruction that can be viewed by students asynchronously or without digital resources.
- Self and Peer Assessment: Encourage student reflection and collaboration for formative assessments.

Allow student choice in scheduling individual learning times to meet weekly learning expectations outside of scheduled synchronous learning opportunities.

Utilize student reflections and recognize they can be completed in various formats to include those that do and do not include technology.

- Opportunities to reflect on the work accomplished and plans for the upcoming week should be provided to students.
- Feedback to students should be timely and relevant

RESOURCES

- [6-8 Online Science Resources](#) - Oregon Open Learning resources
- [9-12 Online Science Resources](#) - Oregon Open Learning resources
- [Oregon Open Learning](#) - additional resources
- [STEM Teaching Tools](#) - Tools that can help you teach science, focused on supporting the teaching of the [Next Generation Science Standards \(NGSS\)](#).