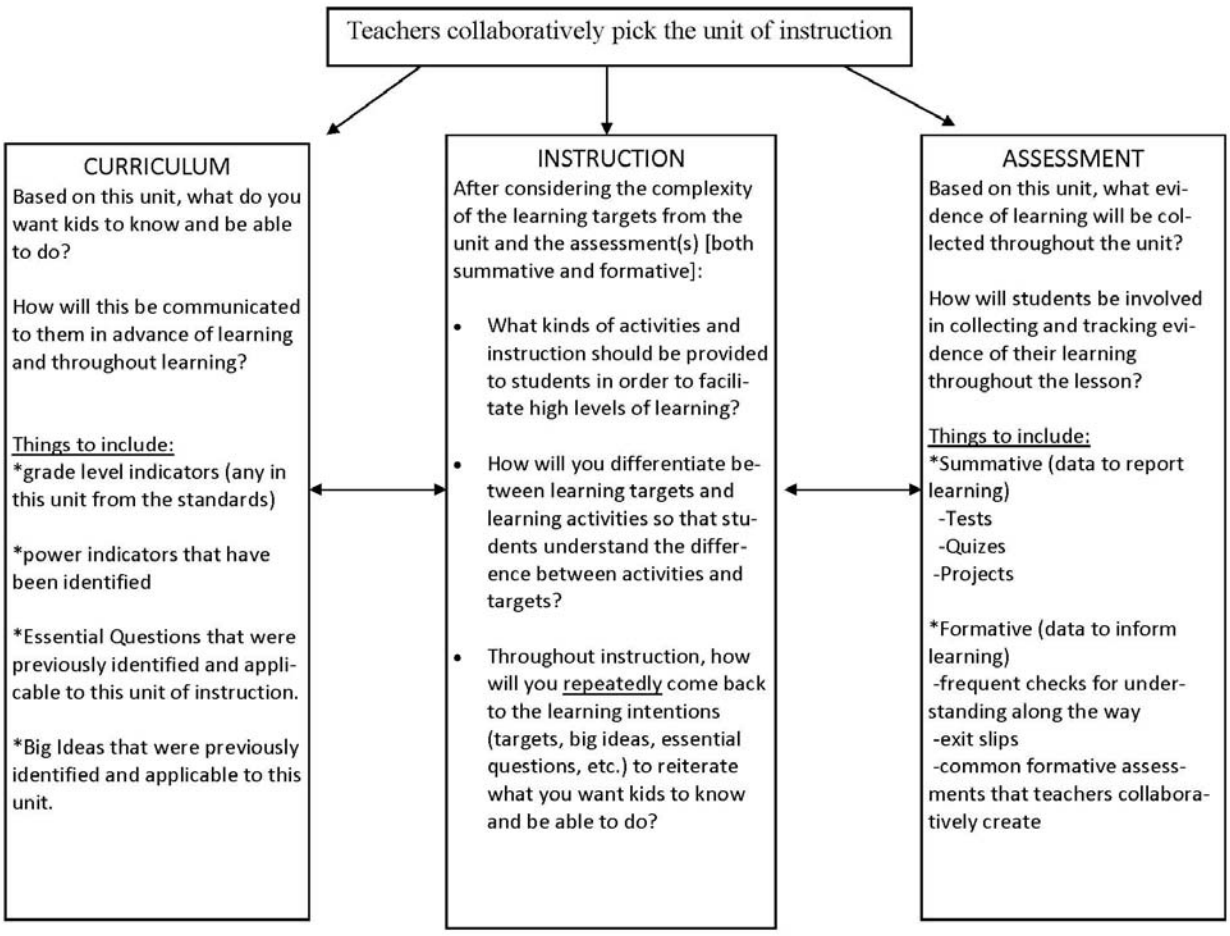
Olmsted Falls Schools: Unit Design Framework

The purpose of the lesson planning framework is to act as a guide for Olmsted Falls Educators as they collaboratively plan units of instruction. The framework attempts to incorporate best practices from the research and couple these with the professional development concepts that Olmsted Falls Educators have taken part in.

Academic content standards and the learning targets that comprise the standards come to life for teachers and students when they are incorporated into a unit of instruction. Teachers work in teams to ensure the learning intentions are the same in corresponding grade levels and subject areas. Teaching the same targets creates the opportunity to collaboratively design common formative assessments that can be collaboratively discussed throughout the instructional unit with fellow teachers. In addition, it allows teachers to design reliable and valid summative assessments that can be used to measure learning at the end of the instructional unit and use the results for future planning.

Ultimately the unit design framework should be used by teachers for the purpose of instructional alignment. The learning targets should be clear to students before and during instruction and they should be aligned with the assessments students will experience. The last step in the alignment process occurs when the learning targets and assessments are consciously aligned with the instruction and classroom activities.

Unit Planning Graphic Linking Prof. Dev. Concepts in Olmsted Falls City Schools



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Subject: Science-6th **Unit:** Scientific Ways of Knowing and Scientific Inquiry

Part I: Clarity of Learning Targets

What are the grade level indicators that go with this unit? Place a star next to the grade level indicators that are Power Indicators. Are the indicators in student friendly language? Place the level of Bloom's Taxonomy next to each Power Indicator.

Scientific Inquiry

1. Explain that there are not fixed procedures for guiding scientific investigations; however, the nature of an investigation determines the procedures needed.

Student Friendly: I can explain different ways to solve a problem.

2. Choose the appropriate tools or instruments and use relevant safety procedures to complete scientific investigations.

Student Friendly: I can choose the safety procedures and tools needed to complete investigation's

3. Distinguish between observation and inference.

Student Friendly: I can tell (distinguish) the differences between observations and inferences.

4. Explain that a single example can never prove that something is always correct, but sometimes a single example can disprove something.

Student Friendly: I can explain that a single example can never prove that something is always correct, but sometimes a single example can disprove something.

Scientific Ways of Knowing

1. Identify that hypotheses are valuable even when they are not supported.

Student Friendly: I can identify the need for a hypothesis when solving a problem.

2. Describe why it is important to keep clear, thorough and accurate records.

Student Friendly: I can describe the importance of accurate data.

3. Identify ways scientific thinking is helpful in a variety of everyday settings.

Student Friendly: I can describe how thinking scientifically can help me in my daily life.

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5. Research how men and women of all countries and cultures have contributed to the development of science.
Student Friendly: I can research the contributions of men and women to science throughout the world. (Completed during Language Arts/Research)

What are the Big Ideas that go with this unit?

Scientific Inquiry

- Problem-solving skills are used in daily living.
- Keeping accurate data is important.
- Generating hypotheses are an important part of science.

Scientific Ways of Knowing

- Scientists pose questions that allow them to direct their investigations.

What are the Essential Questions that go with this unit?

Scientific Inquiry

- How are problem-solving skills used daily?
- Why is it important to keep accurate data?
- What is the purpose of a hypothesis and how is it tested?

Scientific Ways of Knowing

- What questions are important to ask to make good investigations?

What strategies will we use in order to make learning targets clearer for all students, before, during and after instruction? How will you communicate the learning indicators to students?

- Learning targets posted in the classroom – discussed before and during the lesson
- Essential question discussed throughout the unit – learning targets are connected to essential question

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Part II: Feedback and Assessments (Formative and Summative)

How will we provide students with feedback throughout the unit?

What formative assessments will we use? (Non-graded assignments that check for understanding and provide feedback to the students) Incorporate the 7 Strategies of Assessment for Learning here.

- Create "Science is…" poster (formative) - Determine the background knowledge that students have about Science.
- Five Point Observation/Inference Formative Assessment
- Writing a Hypothesis worksheet
- All Scientific Activities and Labs – The students have an opportunity to revise their answers once the teacher has gone over the activity or lab.

How will students be involved with keeping track of their own learning progress (note—this is different than tracking points for a grade)?

- The students will be practicing the steps of the Scientific Method throughout the activities and labs. The students will keep their activities and labs in their notebooks for review.

What summative assessments will we use? (Graded, evaluative assessments)

- Scientific Method and Observation Quiz (Cindy – Save in common folder)
- Observation and Inferences Handout
- M & M Lab

How Can I Close the Gap?

What will we do AFTER the students have completed the formative assessment to differentiate instruction (re-group students, differentiate, review sessions)?

What interventions will we provide for students who do not do well on the formative assessment?

- The students will be given opportunities to correct and revise their answers based on feedback from the teacher.
- M & M Lab – The teacher scaffolds the lesson by providing a structured step-by-step guide to follow.

What will we do for the students who excel? What extension activities will we provide?

- Check Lab
- Act Like an Archeologist

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Part III: Instruction and Student Activities

What instructional and student activities will we use for this unit? These activities should directly align with the indicators and assessments.

1. What is Science? Define and create "Science is…" poster (formative)
2. Observations – Define types of observations (quantitative and qualitative)
3. "Confection Connection"
4. "Candle" Lab
5. "Penny" Observation
6. "Optical Illusions" Smart Board
7. Making an inference – Practice Worksheets
8. "Apple" candle
9. Interpreting an Ancient Puzzle
10. Observe and Infer – "Act Like an Archeologist"
11. Raisin Lab
12. Five Point Observation/Inference Formative Assessment
13. Introduce the Scientific Method – Steps of the Scientific Method
14. Scientific Method Video (United Streaming)
15. Students create and write a hypothesis
16. Scientific Methods Senses Lab (Variables)
17. Sponge Bob Clean Pants – (Controls and Variables)
18. Chocolate/Candy the Scientific Method (Problem, Hypothesis, Research, etc.) – Need to clarify questions
19. M & M's Lab
20. Check Lab (Advanced)
21. "The farmer and the grain" lab (Extra Credit)
22. Scientific Method Crossword

Literacy Strategy: Preview the Text

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