



NH PACE

Performance Assessment for Competency Education Performance Task Template 2017-2018



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<input type="checkbox"/> LOCAL TASK	<input type="checkbox"/> COMMON TASK	<input type="checkbox"/> In Development	<input type="checkbox"/> Reviewed #1	<input type="checkbox"/> Reviewed #2 (NCIEA)	<input checked="" type="checkbox"/> FINAL APPROVED
Performance Task Name <i>Unique name given to this performance task</i>			Code Creators		
Content Area <i>For example: ELA, Science, Math, Social Studies, etc.</i>			Science		
Grade-Level <i>If this is a middle or high school task, indicate grade level and course name if applicable</i>			4		
NH State Model Competencies: Task Targets <i>List each NH State Model Competency that will be assessed through this task; these are one or two <u>primary</u> task targets</i>			<ol style="list-style-type: none"> Nature of Science Patterns 		
Contributing Author(s) <i>List the names, emails, and schools or agencies of ALL contributing authors in the task.</i>			Original Authors: Alyson Bates, Sarah Gaudette, Krista Gulick, Kate MacAskill, Kara Reynolds, LuAnne Pigeon, Amanda Tpzier, Bryan Smith, Meghan Walkama, Virginia Farkas, Casey Ireland, Shannon Mounsey, Garret Ferguson, Sarah Pike, Kelly Jepsen		
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Performance Task Description

Describe the performance task in detail, specifying the context for the task, the anticipated student activities, products and/or presentation and resources, texts, scaffolding, and materials needed. What will the students be asked to do, to produce, and through what actions will they demonstrate mastery of the target competencies? Refer to the NH PACE Accommodations and ELL Guidelines in ensuring that the construction of the task leads to activities that are accessible to all students.

Context: This is a culmination of a unit in which students learned how information can be transferred between places and people. Students compared ways that information is transferred. Students have worked with a variety of systems including, 1's and 0's/pixels, smoke signals, drum signals, etc. Students **should not** have been taught about Morse Code previously. Students will need prerequisite knowledge and skills related to the Nature of Science rubric (predictions, conducting an experiment, developing testable questions, research skills, etc.) as well as **patterns** of communication. Your students will also need to be able to cite simple websites/sources on the research paper. For the purposes of this task, students simply need the title of the source.

Essential Question: How can information be transferred between people in different places?

Student product: This task requires students to use Morse code to send a message across the room. Students will review and change a variable to conduct another trial. The students are prompted as follows: I am challenging you to transfer information using Morse Code to a classmate across the classroom. You cannot go over to them or speak to them directly. Your job is to transfer secret information you want to share with your classmate.

Student Work: Although this is a partner/group task, students are expected to **independently** complete the entire student reflection and all steps marked "this is independent work". However, they are expected to reference and utilize group work pages in their completion of the student reflection. The Nature of Science and Patterns rubrics and teacher materials have notes that show how

students are assessed individually on their contribution to the scientific inquiry process and their understanding of patterns and applications to the real world.

Possible Resources: See additional documents including: PowerPoint presentation on Transfer of Information, Code Creators Resources, 3 Secret Codes to try with your kids, American Sign Language alphabet, Cary Sneider Waves PDF, Chess Cheating, Graph paper printable, Morse Code printable, and Other Fun Codes.

Possible Materials: Students will need to use materials that best transfers their information. This could include: flashlights, graph paper, white boards and markers, clip boards, and reference materials.

Possible Accommodations: Extra time, graphic organizers for notes, assistance organizing materials, assistance recording data, quiet space to work on independent pages, vocabulary/picture lists to scaffold, dictation software/scribe/oral presentation to replace written pieces, and read-aloud type resources. Teachers may modify font size and general formatting of student materials as needed for accommodations. Please reference the PACE Accommodation Guidelines regarding allowable accommodations.

Standards Addressed in the Performance Task

Source of Standards: *List the document(s) from which the standards are drawn i.e. CCSS, NH State Frameworks, NGSS, etc., including any locally developed competencies or standards.*

Standards: *List the complete wording of the target standards associated with the key competencies included above (may copy & paste). There should be a direct and obvious alignment between the standards and the competencies.*

4-PS4-3. Generate and compare multiple solutions that use patterns to transfer information.
[Clarification Statement: Examples of solutions could include drums sending coded information through sound waves, using a grid of 1's and 0's representing black and white to send information about a picture, and using Morse code to send text.]

Crosscutting Concepts: Patterns- Similarities and differences in patterns can be used to sort and classify designed products. (4- PS4-3)

Rubric(s) Used in Assessing this Task

Include all rubrics to be used in the assessment of students' proficiency with this performance task. Be specific in the description of the student product(s) and activities to which the rubric will be applied. Cut and paste or upload the rubric document here. Annotate the rubric to make clear which standards and competencies are aligned with each scoring dimension. Rubrics adapted to student-friendly language should be included in the student instructions section. However, they should align with teacher-use rubrics included here.

Listing which part (activity and/or product) of the task is used for assessment through the rubric assists in comparable administration across districts and replication of the task by various educators.

NOTE: This is the TEACHER ANNOTATED RUBRIC

Nature of Science: Students will demonstrate the ability to work collaboratively and individually to generate testable questions or define problems, plan and conduct investigations using a variety of research methods in various settings, analyze and interpret data, reason with evidence to construct explanations in light of existing theory and previous research and effectively communicate the research processes and conclusions. (Scientific inquiry & engineering design)				
Practices	4 In Addition to Level 3	3 Competent	2 Emergent	1 Limited
Generate testable questions or define problems Inquiry packet: 1, 4, 8, 11	I can generate questions and/or define problems that connect to the real world or scientific ideas. I can make a prediction and support it with evidence.	I can develop testable questions and/or accurately define problems that relate to the investigation. I can make a logical prediction that relates to the investigation. NGSS Science/Engineering Practices 3-5: Specify qualitative relationships <ul style="list-style-type: none"> • Ask questions that can be investigated & predict outcome when a variable is changed • Use prior knowledge to describe problems that can be solved Define a simple design problem that can be solved	I can develop a question(s) and/or define a problem(s) that are related to the investigation. I can make a prediction that relates to the investigation.	I can ask a question(s) that is not testable and/or not related to the investigation. My prediction does not relate to the investigation.
Research, plan, and conduct investigations Inquiry packet: 2, 3, 5, 9, DOK 4: 7	I can use multiple research sources to develop a detailed plan that anyone can follow. I can make improvements throughout the investigation.	I can use research to develop a plan and conduct an investigation. NGSS Science/Engineering Practices 3-5: Include investigations that control variables and provide evidence to support explanations or design solutions <ul style="list-style-type: none"> • Plan & conduct a collaborative investigation • Make predictions about what would happen if variable is changed • Make observations &/or measurements to produce data to serve as evidence • Evaluate method/tool for collecting data Test two different models to determine which is better	I can research, plan, and conduct investigations, but my work is incomplete and/or inaccurate. Student may be able to do all parts, but not at competency level.	I can research, plan, or conduct investigations. Student may be able to do some parts.
Analyze and interpret data Inquiry packet: 6, 10	I can analyze data to draw conclusions and support my thinking with evidence. "Evidence" could be from research as well as from data	I can collect accurate data and analyze it to draw a conclusion(s). Science/Engineering Practices 3-5: Introduce quantitative data collection and conduct multiple trials of qualitative observations <ul style="list-style-type: none"> • Represent data in tables &/or graphical displays 	I can collect, analyze, and interpret data, but the work is incomplete and/or inaccurate. Student may be able to do all parts, but not at competency level.	I can collect, analyze, or interpret data. Student may be able to do some parts.

		<ul style="list-style-type: none"> Analyze & interpret data using reasoning &/or mathematics Compare & contrast data collected by different groups <p>Use data to evaluate and/or refine a problem or design</p>		
<p>Construct explanations using evidence and effective communication</p> <p>Reflection: 1, 2</p> <p>DOK 4: 1, 4</p>	<p>I can apply scientific ideas and/or make real world connections to further support my conclusions.</p>	<p>I can use specific evidence from the data to draw and communicate a detailed conclusion(s) using evidence.</p> <p>Science/Engineering Practices 3-5: Use evidence to construct explanations that describe and predict</p> <ul style="list-style-type: none"> Use evidence to construct or support an explanation or design Apply scientific ideas to solve design problems Generate and compare multiple solutions to a problem <p>Communicate explanation in speaking and/or writing using tables, diagrams, and/or charts</p>	<p>I can recognize a pattern(s) in my data to draw and communicate a basic conclusion(s) about the investigation.</p>	<p>I can draw and communicate an incomplete or inaccurate conclusion about the investigation.</p>

NGSS Patterns: 4-PS4-3. Generate* and compare multiple solutions that use patterns to transfer information.* [Clarification Statement: Examples of solutions could include drums sending coded information through sound waves, using a grid of 1's and 0's representing black and white to send information about a picture, and using Morse code to send text.]

***Generate could mean creating and/or utilizing an existing method**

NH State Competency: Students will sort and classify natural and designed phenomena, identifying similarities and differences, in order to recognize and use patterns.

Patterns	4	3	2	1
<p>Reflection: 3</p> <p>DOK 4: 4</p>	<p>I can explain why I selected and used a pattern for communication. I can apply my understanding to new situations.</p>	<p>I can identify, use and compare two or more patterns to transfer information.</p>	<p>I can identify two or more patterns to transfer information.</p>	<p>I can identify a pattern to transfer information.</p>

Teacher Directions

In this section, describe all directions that the teacher needs to use in the administration of all aspects of the performance task, including lesson focus and formative assessment tasks. Bear in mind that teachers other than the original author(s) will need these directions in order to administer the task. Include hyperlinks for online resources.

Objective: Students will research and try different ways to use Morse Code to send messages. Students will extend their thinking by applying their understanding of information transfer to new situations.

Lessons: Students will be able to explain patterns, explain transfer of information, compare multiple patterns to transfer information, and use a pattern of information. Students will be able to use scientific inquiry: generate testable questions or define problems; research, plan, and conduct investigations; analyze and interpret data; and construct explanations using evidence and effective communication. Lessons will focus on these content areas and include a breakdown of scientific inquiry investigation.

Formative Assessments: Possible formative assessments include: journal entries or exit slips (Inquiry Packet.), teacher observations, research page, notes on group work and progress throughout task.

Possible Time: First session (approximately 90 minutes): review goals and steps, discuss rubric and expectations, research, and take notes on different patterns of communication.

Second session (approximately 90 minutes, or 2 45-minute days) trials to transfer information

Last session for reflection (approximately 60 minutes).

Materials: **Please see the above for materials and resource lists.** Teacher should also have available class sets of student directions, research and plan page, questions and predictions page, changes page, messages and observations page, and reflection packet.

Learning Plan: Day 1: Provide student direction page to each student. Reference the Teacher Version of the Student Materials to explain what pages students are expected to complete individually as they work with a group and the pages that must be completed independently (labeled either "group work" or "independent work"). Review the goal and steps. Discuss the rubric and expectations. Students will review the research material provided by the teacher. Students should take notes on the different patterns of communication on the Research Page.

Days 2-3: Using the research notes students took on Day 1, they should work with their partner or group to generate ideas on how they could transfer information. Through the discussion, students should decide on a single way to use Morse Code in their first trial. Students will be asked to record testable questions and then proceed to conduct their first trial. The teacher will use the list of messages to assign each student with the information they are transferring (see list of messages below). Each student should create their message using their chosen pattern of communication independently. **It is imperative that the students do not share their messages during this time.** Students should conduct the first trial by transferring their messages to their partners. Next, students should conduct the second trial in which they send a different message using a different pattern of communication. After the trials, students should reflect on the process, recording what went well and what might need to be improved.

List of Potential Messages (See Teacher Material with page with all messages for each trial)

I like pizza

You are smart

You are kind

It is sunny

I like school

My favorite color is ____ (fill in color)

What is your name?

Why not?

I like to read

Yesterday was ____ (fill in day)

Day 4: Students will complete the Reflection packet independently.

Student Instructions

Describe clearly and in detail all student instructions used in the administration of this performance task. Attach or upload aligned rubrics that have been adapted to student-friendly language.

Please see the Task LibGuide for full student instructions: Code Creators Inquiry Packet and Code Creators Reflection Page

Essential Question: How is information best transferred between people in different places?

Scenario: I am challenging you to transfer information using Morse Code to a classmate across the classroom. You cannot go over to them or speak to them directly. Your job is to transfer secret information you want to share with your classmate without talking with them directly.

Procedure:

1. Write questions you have about Morse Code and how it can be used to transfer information between people in different places.
2. Research "Morse Code for Kids". Read through the research materials. Consider these questions as you **record your findings** below:
 - a. What is Morse Code?
 - b. What are different ways you can use Morse code to transfer information?
3. With your partner/group, decide on a way you could use Morse Code to transfer information across the room and write the plan below (include what materials you need). Remember to use the information from your research!
4. Scientists record testable questions before, during, and after conducting investigations. **Independently** record your questions before you start
5. See your teacher before starting this step. Conduct the first trial. You and your partner/group will stand on opposite sides of the room directly across from each other. Check off your role (sending or receiving the message) using the boxes below. **Remember that your partner should NOT see this message before you transfer it.**
6. After both partners have record the messages independently. Look at the messages you both recorded to analyze the accuracy of your communication method. Was your message accurate? What would you change? Record your thoughts.
7. Now, pick **one** thing to change from your original plan. You will test this out in Trial 2. Remember to use information from your research and include all materials
8. On your own, write a prediction about how the changes you made for this trial will impact how accurately the message will be received. Remember to support your thinking with **evidence!** This **must** be completed before transferring your messages!
9. See your teacher before starting this step. Conduct Trial 2 for your use of Morse Code. You and your partner will stand on opposite sides of the room directly across from each other. Check off your role (are you sending or receiving the message?). **Remember that your partner should NOT see this message before you transfer it**
10. After both partners have record the messages independently. Look at the messages you both recorded to compare the accuracy of your communication method. Was your message accurate? What would you change? Record your thoughts.
11. Independently, record your testable questions.
12. **Reflect independently** on this experience. **Write in complete sentences and paragraphs** on the reflection page. **Use specific evidence from your observations and precise words to support your thinking.**

Code Creators Reflection Page

1. Imagine you're in a completely dark room and need to transfer a secret message to your friend across from you. Choosing from among your trials or your classmates' trials, select what you think would be the best method to use for this situation. Be sure to explain why that method is the best one to use.
2. Which of your trials worked best for you and your group? Use evidence from your trials to support your answer.
3. Identify and compare **two** patterns of communication. Use a way you know to show your information in an organized way (chart, Venn diagram, etc.).
4. Matt and Jen decided they would use a flashlight as their way to send a Morse code message from one to the other during a snowstorm. Matt's window is 8 meters away from Jen's window. According to the weatherman, there are white-out conditions with a visibility of only 2 meters.

Will Matt and Jen be able to successfully transfer a secret message? _____

Why or why not? Remember to use evidence to support your thinking.

Artifacts

Optional: In this section, include links to artifacts depicting student products that may be useful in gaining greater clarity of this performance task. These may be digital pictures, podcasts, websites, etc.