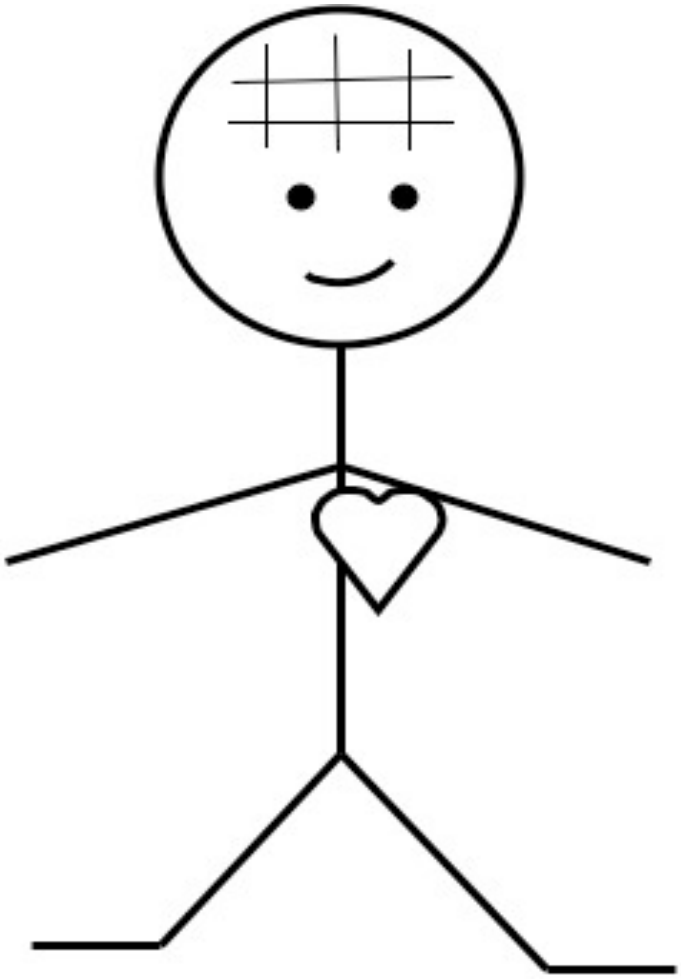
Developing Thinking

Expanding Knowledge

The Nonfiction Learning Connection



A guide developed by the Center for Urban Education for the ASPIRE initiative.

GROW LEARNING

Goal: Learn more about _____

Read to Learn

Organize What You Learn

Write What You Learn

Core Knowledge

KINDS OF KNOWLEDGE

Factual Knowledge—Basic information

Knowledge of terminology
Vocabulary terms, mathematical symbols, musical notation, alphabet
Knowledge of specific details and elements
Components of the Food Pyramid, names of congressional representatives, major battles of WWII

Conceptual Knowledge—The relationships among pieces of a larger structure that make them function together

Knowledge of classifications and categories
Species of animals, different kinds of arguments, geological eras
Knowledge of principles and generalizations
Types of conflict in literature, Newton's Laws of Motion, principles of democracy

Knowledge of theories, models, and structures

Theory of evolution, economic theories, DNA models

Procedural Knowledge—How to do something

Knowledge of subject- specific skills and algorithms
Procedure for solving quadratic equations, mixing colors for oil painting, serving a volleyball

Knowledge of subject- specific techniques and methods
Literary criticism, analysis of historical documents, mathematical problem-solving methods
Knowledge of criteria for determining when to use appropriate procedures
Methods appropriate for different kinds of experiments, statistical analysis procedures used for different situations, standards for different genres of writing

Metacognitive Knowledge—Knowledge of thinking in general and your thinking in particular

Strategic knowledge
Ways of memorizing facts, reading comprehension strategies, methods of planning a Web site

Knowledge about cognitive tasks, including appropriate contextual and conditional knowledge
Different reading demands of textbooks and novels; thinking ahead when using an electronic database; differences between writing emails and writing business letters

Source: Intel Teach Program

Want more knowledge about the connection between Knowledge and Cognition?

This chart shows the connection—and possible progression.

The Knowledge Dimension	The Cognitive Process Dimension					
	Remember	**Understand**	**Apply**	**Analyze**	**Evaluate**	**Create**
Factual Knowledge	List	Summarize	Classify	Order	Rank	Combine
Conceptual Knowledge	Describe	Interpret	Experiment	Explain	Assess	Plan
Procedural Knowledge	Tabulate	Predict	Calculate	Differentiate	Conclude	Compose
Meta-Cognitive Knowledge	Appropriate Use	Execute	Construct	Achieve	Action	Actualize

http://oregonstate.edu/instruct/coursedev/models/id/taxonomy/#table
Designer/Developer - Dianna Fisher
Caption:
As one can see from the Oregon State chart above,
the intersection of the six Cognitive Process defined dimensions
(Remember, Understand, Apply, Analyze, Evaluate, and Create)
with the four Knowledge Dimensions
(Factual, Conceptual, Procedural, and Meta-Cognitive)
forms a grid with twenty-four separate cells as represented.

Each of the cells contains a hyperlinked verb that launches a pop-up window containing definitions and examples.

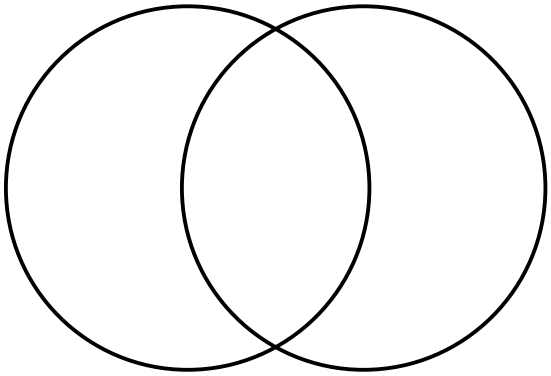
Reading: A Way to Expand Knowledge and Thinking

KEY IDEAS AND DETAILS
1. **Read closely** to **determine** what the text says **explicitly** and to **make logical inferences** from it; **cite specific textual evidence** when writing or speaking to **support conclusions drawn from** the **text**.
2. **Determine central ideas or themes** of a text and **analyze** their **development**; **summarize** the **key supporting details** and **ideas**.

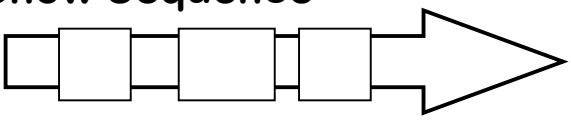
Classify and Clarify

Category	Category

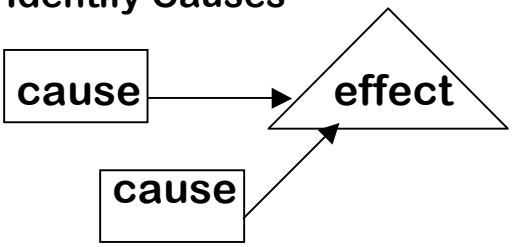
Compare and Contrast



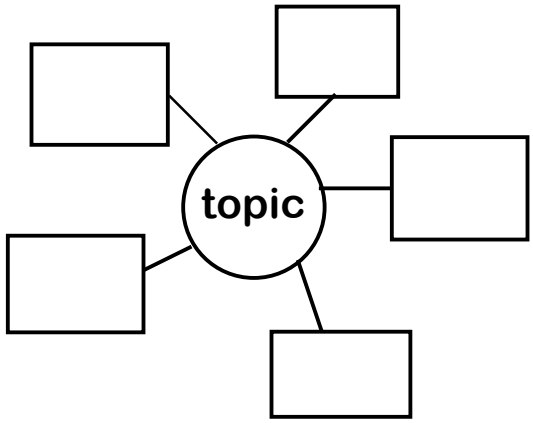
Show Sequence



Identify Causes and Effects



Organize Information

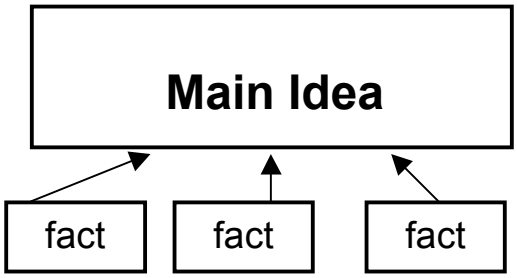


Support Inferences

information → ***inference***

Facts	*Inference*

Infer and Support Ideas



Graphic Organizer Assessment Rubric

Usually a graphic organizer is part of a process, it is a way to organize information, **an intermediate step to writing about a topic or situation or organizing more ideas and information for a unit or presentation**.

It can be a **"pre-writer"** that students use to focus their writing. Even if the student only writes a sentence or paragraph based on the graphic organizer, that writing step is essential to ensuring that the student thinks through the ideas and information in the graphic.

Students should meet the following criteria when making a graphic organizer:

- **Is it complete?**
- **Is it correct?**
- **Is it clear?**

The following rubric can be used as a **checklist** for making sure that the organizer is complete and useful as students base their writing on the information they have organized. *Students can improve their responses so they reach the top level.*

SHOW CLEAR THINKING

Rating	Requirements
4	☐ Provides information for each part of the organizer ☐ All information is correct ☐ Gives organizer a title (if it does not have one) ☐ Writes about the organizer—an explanation, summary, or application of what the organizer presents (complexity varies with grade level—from sentence through extended response) ☐ Cites the source of the information (grades 5-8)
3	☐ Provides information for each part of the organizer ☐ All information is correct
2	☐ Provides information for most parts of the organizer ☐ Most information is correct
1	☐ Provides information for part of the organizer ☐ Some information is correct

Non-Fiction Writing Expands Thinking and Knowledge

Common Core Anchor Standards for Writing

Text Types and Purposes
1. Write arguments to support claims in an analysis of substantive topics or texts, using valid reasoning and relevant and sufficient evidence.
2. **Write informative/explanatory texts to examine and convey complex ideas and information clearly and accurately through the effective selection, organization, and analysis of content.**
3. Write narratives to develop real or imagined experiences or events using effective technique, well-chosen details, and well-structured event sequences.

Production and Distribution of Writing
4. Produce clear and coherent writing in which the development, organization, and style are appropriate to task, purpose, and audience.
5. Develop and strengthen writing as needed by planning, revising, editing, rewriting, or trying a new approach.
6. Use technology, including the Internet, to produce and publish writing and to interact and collaborate with others.

Research to Build and Present Knowledge
7. Conduct short as well as more sustained research projects based on focused questions, demonstrating understanding of the subject under investigation.
8. Gather relevant information from multiple print and digital sources, assess the credibility and accuracy of each source, and integrate the information while avoiding plagiarism.
9. Draw evidence from literary or informational texts to support analysis, reflection, and research.

Range of Writing
10. Write routinely over extended time frames (time for research, reflection, and revision) and shorter time frames (a single sitting or a day or two) for a range of tasks, purposes, and audiences.

Topic: _____

BIG QUESTION: _____

Read *CCSSR1* *Use reading strategies ILS1B* *Comprehend different texts ILS1C*	What will students read?
Expand Vocabulary CCSSR4	What words will they learn? How will they learn them? __read __write with them __picture them __make glossary
Organize *Organize information to explain a topic (ILS5A)* *CCSSR2*	How will students clarify what they learn? Make a ___chart __timeline ___diagram ___outline
Write *Explain a topic (ILS3B)* *CCSSW2*	What will they WRITE? __ paragraph __ letter __ poem __guide __news report __ _____

How will students share what they learn to expand everyone's learning?

__draw pictures __make a collage __illustrate a word wall

__dramatize __write a story ___make a picture glossary

__make a bulletin board __present what they learn to another class

__make a booklet for another grade—or the school library

__ _____

Example of a week of integrated literacy and content learning

ILS5A Locate, collect, organize, analyze, synthesize, and use information from various sources to answer questions, solve problems and communicate ideas.

Common Core Anchor Reading Standards: 1. Read closely to determine what the text says explicitly and to make logical inferences from it; cite specific textual evidence when writing or speaking to support conclusions drawn from the text. 2. Determine central ideas or themes of a text and analyze their development; summarize the key supporting details and ideas. 4. Interpret words and phrases as they are used in a text, including determining technical, connotative, and figurative meanings, and analyze how specific word choices shape meaning or tone.

Common Core Writing Anchor Standard 2. Write informative/explanatory texts to examine and convey complex ideas and information clearly and accurately through the effective selection, organization, and analysis of content.

Topic: _____

BIG Question: _____

Core Vocabulary: _____

Monday **Focus with Interest**	**Tuesday** **Get Informed**	**Wednesday** **Organize and Expand**	**Thursday** **Summarize**	**Friday** **Synthesize**
T: Introduce the week's **BIG question** Preview **key words**, connect to prior knowledge. **Read aloud** about topic S: **List or draw interesting facts** from reading. Start **glossary.**	T: Model How to **collect facts from a passage.** S: **Read to locate and collect important facts** relevant to the Big Question. Expand glossary.	S: Use graphic organizer to **organize information**. Collect more information for the organizer. Continue glossary.	S: **Write** about this week's topic using this week's words—write based on the graphic organizer. Complete glossary.	S: Answer the BIG question—create **booklet, exhibit, letter, picture, other format to communicate answers to the BIG question.**

Multi-Week Content Learning Plan

ILS5A Locate, collect, organize, analyze, synthesize, and use information from various sources to answer questions, solve problems and communicate ideas.

Common Core Anchor Reading Standards: 1. Read closely to determine what the text says explicitly and to make logical inferences from it; cite specific textual evidence when writing or speaking to support conclusions drawn from the text. 2. Determine central ideas or themes of a text and analyze their development; summarize the key supporting details and ideas. 4. Interpret words and phrases as they are used in a text, including determining technical, connotative, and figurative meanings, and analyze how specific word choices shape meaning or tone.

Common Core Writing Anchor Standard 2. Write informative/explanatory texts to examine and convey complex ideas and information clearly and accurately through the effective selection, organization, and analysis of content.

Content Standard: _____

FOCUS/BIG QUESTION: _____

Concepts that I want students to understand

Assessment: __student presentations __drawings ___writing_____
__portfolio __presentation __ _____

Skills and Strategies Students will Expand:		
Read to Learn	**Write to Explain**	**Illustrate to Communicate** *ILS26B*

Part	This Week's Focus/Question and Vocabulary	**This Week's Reading**	**Activities**
1			
2			
3			
4			

Plan Learning that Moves from Knowledge to Higher Levels of Thinking.

LEVEL	Activity
Knowledge	
Comprehension	
Application	
Analysis	
Evaluation	
Synthesis	
Creativity	

Bloom's Taxonomy, Thinking Actions and Products

Add more products—relate them to the subject(s) you teach.

LEVEL	Actions	Products
Knowledge	define, describe, duplicate, label, locate, list, memorize, recall, repeat, reproduce, state	glossary, list
Comprehension	classify, collect, describe, explain, identify, illustrate, paraphrase, recognize, report, restate, translate	chart, drawing, sequence chart, timeline
Application	adapt, change, choose, demonstrate, employ, illustrate, interpret, operate, schedule, sketch, solve, use	illustration, model, report
Analysis	categorize, compare, contrast, differentiate, discriminate, distinguish, examine, experiment, predict, organize, question, select	diagram, flowchart, presentation, report
Evaluation	appraise, argue, criticize, defend, evaluate, judge, rank, select, sort, support, value	editorial, rating, report, speech
Synthesis	combine, connect, integrate, relate	artwork, article, booklet, exhibit, poem, report, speech, story
Creativity *New category added in the 1990s.*	assemble, construct, create, design, develop, dramatize, formulate, invent	artwork, booklet, exhibit, poem, report, speech, story

Next Generation Assessments
International Center for Leadership in Education

www.nextnavigator.com

Student Work

Student work is at the heart of learning. Focusing on student work is also an excellent means of measuring the quality of instruction. Student work is defined as the observable effort or tangible products produced by a student. Student work provides the most tangible evidence of the learning process. The best way to judge the quality of teaching and learning is by looking at the work that students are producing in the classroom.

- Is the work meaningful and challenging?
- Are all students actively engaged?
- Do students have a clear understanding of what constitutes outstanding work?
- Do students who commitment to and enthusiasm for their work?

Answers to these questions provide rich evidence of the quantity and quality of learning taking place. Teachers should spend time thinking about what significant pieces of work students will produce and not limit themselves by simply defining the content and objectives for what students will learn. The following list of student work is a good reference for defining student work as part of assessment planning.

- Advice letter
- Analysis of painting
- Analyzing primary sources
- Argument analysis
- Article reviews
- Biography analysis
- Cartoon
- Character analysis
- Chart
- Complaint letter
- Data analysis
- Debate
- Error analysis
- Field guide
- Film analysis
- Geometric analysis
- Graph
- Interview Questions
- Journal entry
- Letter writing
- Literary analysis
- Logical sequences
- Map
- Memo
- News report
- Oral history
- Persuasive letter
- Planning for a task
- Poem
- Poster
- Preparing for a discussion
- Proposal
- Proposals and criteria
- Questionnaire
- Questions
- Real-world problem solutions
- Road trip directions
- Rules
- Scale model
- Speech critiques
- Survey
- Taxonomy
- Timelines

Thinking Skill Resources

Bloom's Revised Taxonomy: The Cognitive Process Dimension
www.schoolnet.org.za/twt/01/M1_Appendix_B.pdf

Remember

Recognizing
Identify frogs in a diagram of different kinds of amphibians. Find an isosceles triangle in your neighborhood. Answer any true-false or multiple-choice questions.

Recalling
Name three 19th century women English authors. Write the multiplication facts. Reproduce the chemical formula for carbon tetrachloride.

Comprehend

Interpreting
Translate a story problem into an algebraic equation. Draw a diagram of the digestive system. Paraphrase Lincoln's Second Inaugural Address.

Exemplifying
Draw a parallelogram. Find an example of stream-of-consciousness style of writing. Name a mammal that lives in our area.

Classifying
Label numbers odd or even. List the kinds of governments found in modern African nations. Group native animals into their proper species.

Summarizing
Make up a title for a short passage. List the key points related to capital punishment that the Web site promotes.

Inferring
Read a passage of dialogue between two characters and make conclusions about their past relationship. Figure out the meaning of an unfamiliar term from the context. Look at a series of numbers and predict what the next number will be.

Comparing
Explain how the heart is like a pump. Write about an experience you have had that was like the pioneers moving west. Use a Venn diagram to demonstrate how two books by Charles Dickens are similar and different.

Explaining
Draw a diagram explaining how air pressure affects the weather. Provide details that justify why the French Revolution happened when and how it did. Describe how interest rates affect the economy.
Apply—Use a procedure

Executing
Add a column of two-digit numbers. Orally read a passage in a foreign language. Shoot a free throw.

Implementing
Design an experiment to see how plants grow in different kinds of soil. Proofread a piece of writing. Create a budget.

Apply

Executing
Add a column of two-digit numbers. Orally read a passage in a foreign language. Shoot a free throw.
Implementing

Design an experiment to see how plants grow in different kinds of soil. Proofread a piece of writing.
Plan a budget.

Analyze

Differentiating
List the important information in a mathematical word problem and cross out the unimportant information.
Draw a diagram showing the major and minor characters in a novel.

Organizing
Make a chart of often-used figurative devices and explain their effect. Make a diagram showing the ways plants and animals in your neighborhood interact with each other.

Attributing
Read letters to the editor to determine the authors' points of view about a local issue. Determine a character's motivation in a novel or short story. Look at brochures of political candidates and hypothesize about their perspectives on issues.

Evaluate

Checking
Participate in a writing group, giving peers feedback on organization and logic of arguments. Listen to a political speech and make a list of any contradictions within the speech.
Review a project plan to see if all the necessary steps are included.

Critiquing
After co-developing a rubric for the evaluation of a project, judge how well a project meets the criteria.
Choose the best method for solving a complex mathematical problem. Judge the validity of arguments for and against astrology.
Create—Put pieces together to form something new or recognize components of a new structure

Generating
Given a list of criteria, list some options for improving race relations in the school. Generate several scientific hypotheses to explain why plants need sunshine.
Propose a set of alternatives for reducing dependence on fossil fuels that address both economic and environmental concerns. Come up with alternative hypotheses based on criteria.

Synthesize

Generating
Given a list of criteria, list some options for improving race relations in the school. Generate several scientific hypotheses to explain why plants need sunshine.
Propose a set of alternatives for reducing dependence on fossil fuels that address both economic and environmental concerns. Come up with alternative hypotheses based on criteria.

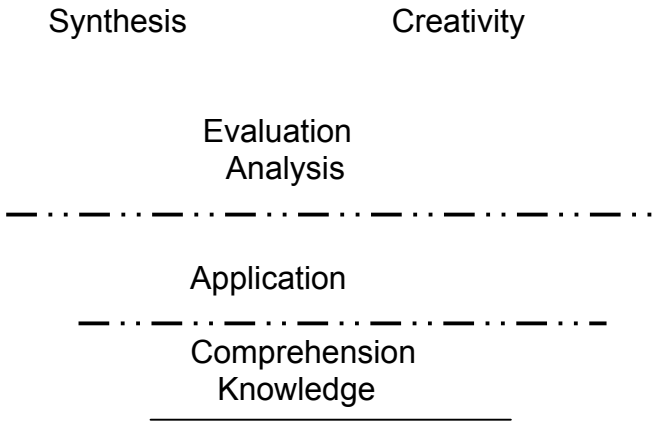
Planning
Make a storyboard for a multimedia presentation on insects. Outline a research paper on Mark Twain's views on religion. Design a scientific study to test the effect of different kinds of music on hens' egg production.

Producing
Write a journal from the point of view of a Confederate or Union soldier. Build a habitat for local water fowl. Put on a play based on a chapter from a novel you're reading.

Plan a Thinking Progression
Choose a chunk—important content.

The Chunk—what will you teach?

Plan a sequence of activities at increasing levels of complexity.



Example: Biology

The Chunk: Animal Adaptation—structure and function

Knowledge
List bird adaptations explained in article.

Comprehension
Complete a chart with examples of animal adaptations based on chapter on birds.

Application
Infer relationship between structure and function for adaptations of an unfamiliar bird, including leg length, wing size, kind of feet, kind of bill.

Analysis
Make a diagram of a fish, indicating how its structures would enable it to survive.

Evaluation
Contrast different structures of a fish. Decide which structures are most essential to the fish's survival in its habitat.

Synthesis
Design a bird to live in a challenging habitat, explaining the reasons for the adaptations.

Plan Progressive Learning

The Chunk:

Knowledge

Comprehension

Application

Analysis

Evaluation

Synthesis

Poetry Week Planner

Choose a theme for the week such as the importance of hope, meeting challenges, or another theme, and identify poems that communicate that theme.
Choose a format or formats of poetry to incorporate.

This plan would develop ILS1B, interpreting the meaning of a poem and the way the author's choice of words and writing style affects meaning; lLS3B, writing in a variety of formats to communicate an idea or theme.

Common Core Anchor Standard 2. Determine central ideas or themes of a text and analyze their development; summarize the key supporting details and ideas.

Monday	Tuesday	Wednesday	Thursday	Friday
T: Introduce BIG question—How do poets communicate ideas? Read poem aloud, point out technique(s). S: Analyze poem—how does the author communicate the idea? Note important words that give the poem its tone and meaning.	T: Guide students to analyze a poem—techniques used, message communicated—in first stanza. S: Continue the analysis. Illustrate what the poem says to you. Note important words that give the poem its tone and meaning. Chart the poem: techniques used Diagram the poem: Idea communicated—what images, examples express that idea.	S: Choose a topic/theme for your own poem—it can be your poem on same topic/theme as this week's poem Plan what your poem will say. List images you will include in it. Draft it today. Use one of the formats you knew or format presented this week.	S: Expand your poem or work with another student to enhance each other's poems. Illustrate your poem.	S: Poetry "slam" –read your poem aloud with great expression.

POEM READER

Common Core Anchor Standard 2. Determine central ideas or themes of a text and analyze their development; summarize the key supporting details and ideas.

Hope is the Thing With Feathers
Emily Dickinson

Hope is the thing with feathers
That perches in the soul,
And sings the tune without the words
And never stops - at all.

And sweetest--in the Gale--is heard,
And sore must be the storm,
That could abash the little Bird
That kept so many warm.

I've heard it in the chillest land,
And on the strangest Sea.
Yet, never, in Extremity
It asked a crumb--of me.

Esperanza es la Cosa Con Plumas
Emily Dickinson
Translated by Arturo Romero Rendon

Esperanza es la cosa con plumas
Que se asienta en el alma,
Y canta la melodía sin palabras
Y nunca se detiene -- para nada.

Y lo dulce –- en el Ventarrón –- se escuchó,
Y abatida debe estar la tormenta,
Que pudiera desconcertar a la pequeña Ave
Que guardaba mucho calor.

Lo he escuchado en las tierras gélidas,
Y en los mares místicos.
Mas, nunca en Extremo
Pidió una migaja –- mía.

Draw a picture that shows what this poem means to you.

What is the theme of the poem?

_____

Why do you think that is the theme?