

Leveled Questioning Activity Idea (AI): Graphics and Inquiry: Animal Voices Bridging (Bridges 6–8)

This graphic describes how the size of an animal influences the sounds they make.

Core Content Areas

Science

AVID Elementary Components

Student Success Skills, Partnerships, Inquiry,
Collaboration, Organization

Common Core Connections

CCSS.ELA-LITERACY.CCRA.R.7

Integrate and evaluate content presented in diverse media and formats, including visually and quantitatively, as well as in words.

CCSS.ELA-LITERACY.CCRA.SL.1

Prepare for and participate effectively in a range of conversations and collaborations with diverse partners, building on others' ideas and expressing their own clearly and persuasively.

CCSS.ELA-LITERACY.RI.4.2

Determine the main idea of a text and explain how it is supported by key details; summarize the text.

CCSS.ELA-LITERACY.W.4.1

Write opinion pieces on topics or texts, supporting a point of view with reasons and information.

Preparation and Differentiation

1. Access the AVID Elementary Weekly graphic, "What gives animals' voices their range?" Determine whether the graphic will be provided in electronic or paper copy. The class may use the Class Login function on the AVID Elementary Weekly website for students to access the graphic electronically.
2. Determine the level of support required for all students (including General Ed, Special Ed, and ELL populations) to move successfully through the levels of thinking and build academic skills.
3. Identify collaborative groups for specific components of the lesson. (Collaboration)
4. Develop at least two leveled questions from each of Costa's Levels of Thinking, related to information on the

graphic. Questions should build off of one another, gaining complexity and demanding increased thoughtfulness throughout each of the levels. (Inquiry)

Flexible Grouping: provides an opportunity to differentiate instruction within whole group, small group, one-to-one, or independent learning.

Support Tools: prepare and incorporate non-linguistic representations, teacher-created notes, CLOZE activities/reading, translations, etc.

Academic Language Scripts: provide an opportunity for oral language development by creating a structured way for students to engage in academic discourse for vocabulary and language development in a scholarly environment.

Rehearsal and Revision: engage students in practice of formal register (vocabulary and language development) in which they attempt, practice, and correct their own responses.

Sentence Frames: prepare and incorporate guiding prompts for questions and responses to provide scholarly visual anchors for students to add their own ideas.

Word Banks: prepare and incorporate lists of content or academic vocabulary that students are able to choose from to integrate into a personal written or oral response.

Writing + Speaking; Speaking + Writing: incorporate writing and speaking activities that are paired together to practice oral and written responses.

Inquiry-Based Differentiation

Before (Level 1)	During (Levels 1, 2, 3)	After (Level 3)
Establishing prior knowledge	Gathering information	Reflecting on learning
Gathering information	Thinking about and comparing information	Making connections
	Applying the information	

Organization

This inquiry activity is intended to provide an opportunity for students to utilize organizational skills while assessing and formulating questions. These questions motivate students to use higher order thinking to deepen their learning. Students use a 3-column chart to organize information and reflections about the graphic. Students explore Costa’s Levels of Thinking as they make connections to prior knowledge, compare and contrast important facts, and make personal judgments.

- Connect concepts and topic to grade-level-specific standards and/or frameworks.

Process

1. Provide students with access to the AVID Elementary Weekly graphic, “What gives animals’ voices their range?”
2. Using the STAR note-taking strategy (Set up notes; Take notes; Add to notes; Review notes), model how to set-up 3-column notes, including title and subtitles. (Organization)
3. Students work independently or with a study buddy to analyze the graphic and take 3-column notes on the AVID Elementary Weekly graphic, “What gives animals’ voices their range?” Students respond to pre-determined leveled questions, which are written in the first column of the 3-column chart. The third column is used for student-created questions for independent thinkers. (Organization)

Animal Voices

Leveled Questions	Student Responses	Student-Created Leveled Questions
<p>Level 1: Gathering – “On the page” or “From the book”</p> <p><i>Suggested vocabulary prompts: Define, List, Identify, Describe, Give examples</i></p> <p>Underline the title of the graphic.</p> <p>List the animals described in the graphic.</p> <p>Which animal has the longest vocal cord length?</p> <p>Which animal has the widest vocal range?</p> <p>Describe what controls the pitch of voice.</p> <p>Describe what the study is examining.</p>		

Level 2: Processing – “Between the lines” or “From the book and brain”

Suggested vocabulary prompts: Interpret, Compare, Contrast, Analyze, Compose, Design, Imagine, Distinguish

Describe the graphic.

Analyze the differences between animals with long and short vocal cords.

Compare and contrast the voices of a tiger and a raccoon.

Which animal has the most surprising data? Explain.

Level 3: Applying – “Off the page” or “From the brain”

Suggested vocabulary prompts: Judge, Evaluate, Justify, Explain, Give reasons for your answer, If/Then

Using prior knowledge about animals, describe how an animal uses sound to communicate and survive.

Choose an animal that is not listed on the graphic. Using prior knowledge and information from the graphic, how long do you think your selected animal’s vocal cord is? What do you predict its vocal range to be? Give reasons for your answer.

Is this study important? Why or why not?

How do humans’ voices impact their lives? How do you use your voice to communicate with others? How else can you communicate, besides using your voice?

4. Collaborative groups of four share their responses from their notes. Students add pertinent information or additional facts to notes. (Collaboration and Organization)

Variations

1. Using a teacher-provided list of vocabulary from each of Costa’s Levels of Thinking, write your own leveled questions about the graphic.
2. Using vocabulary from Costa’s Levels of Thinking as well as teacher-provided sentence frames and question frames, develop leveled questions about the graphic.
3. Using teacher-provided leveled questions, work in a small group of 2–4 peers to “Name That Level” and organize leveled questions into a 3-column note-taking chart.
4. Create personalized leveled questions in the third column of the note-taking chart. Trade questions with a partner and develop responses to each other’s questions.

Science Matters

What gives animals' voices their range?

Large animals have deep voices and small ones, high-pitched voices; however some details of anatomy determine how wide a range of pitches the animal – for example, a human – can make.

Size matters, sort of

New study examined voices and anatomy of 16 animal species; some examples

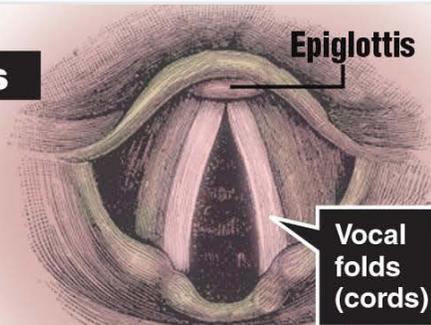
VOCAL CORD LENGTH (in mm)
and **VOCAL RANGE** (frequency in Hz)

	Elephant: 100 mm	
	Tiger: 40 mm	20-250*
	Lion: 38 mm	20-250*
	Elk: 21-24 mm	100-2,400*
	Human: 10-16 mm	90-800*
	Dog: 8 mm	60-1,500
	Rhesus monkey: 8 mm	100-1,800
	Raccoon: 4 mm	200-4,000
	Guinea pig: 2 mm	250-4,000
	Mouse: 1 mm	1,000-9,000
	Bat: 1 mm	2,000-80,000

Small range (points to Human, Dog, Rhesus monkey)

Wide range (points to Mouse, Bat)

* Male low to female high



HUMAN LARYNX (seen from above)

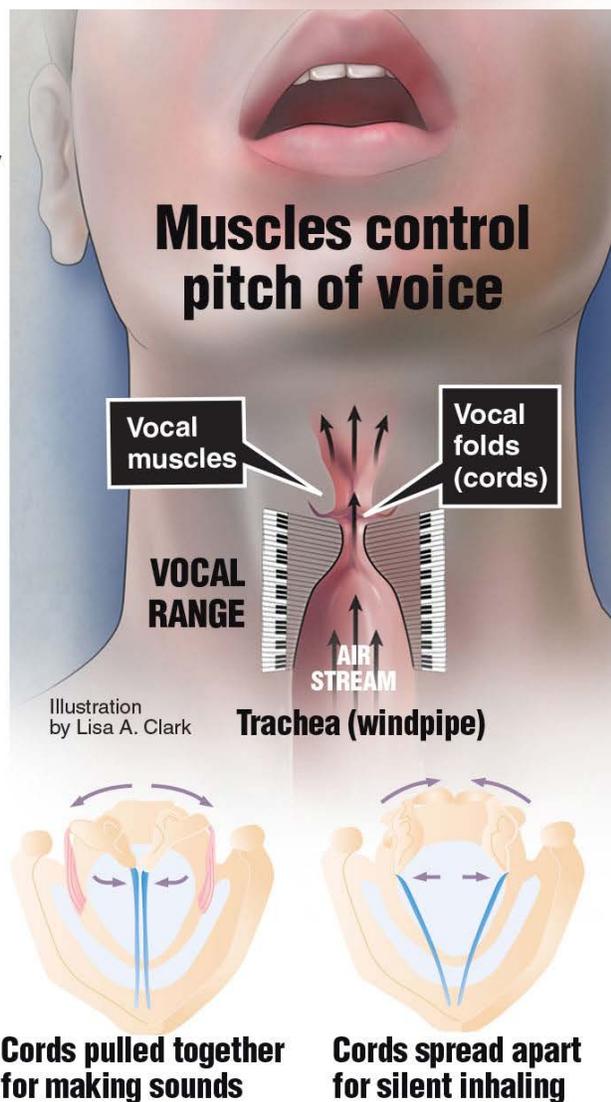


Illustration by Lisa A. Clark

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