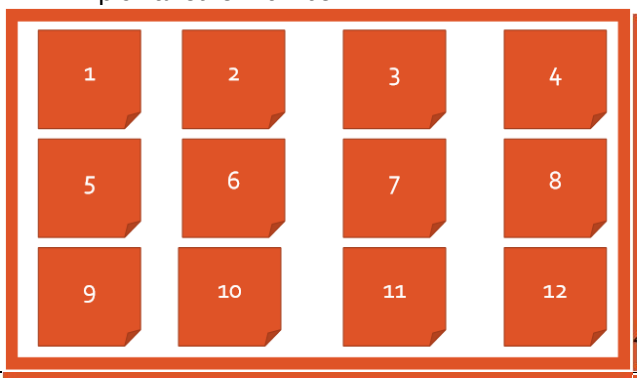
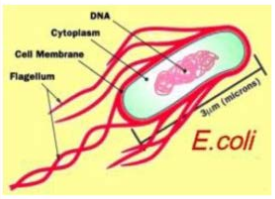
School:	Booker T. Washington	Subject:	Research	Teacher:		Lesson Plan Date:	

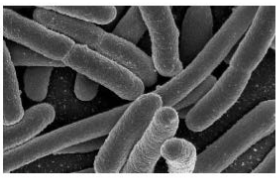
PRE-PLANNING	**OBJECTIVE** What will your students be able to learn?	**BENCHMARK**:	
	To understand how to classify organisms and create cladograms	(no pacing guide given for research)	
	ASSESSMENT *"Begin with the End in Mind"* How will you know whether your students have made progress toward the objective? How and when will you assess mastery?		
	Students will exhibit proficiency in the subject when they are able to accurately identify which kingdom any given organism belongs to, as well as what characteristics determine the reasoning as to why they belong in that kingdom. Mastery will be assessed through participation in the exercise as well as performance on the worksheet.		
	ESSENTIAL QUESTION A higher order question that is directly derived from the benchmark, introduced at the beginning of the lesson, discussed throughout the lesson, and answered by students at the end of the lesson to show understanding of the concepts taught.		
	What characteristics allow us to classify organisms into kingdoms and how can we use them to create a cladogram?		
	HIGHER ORDER QUESTIONS (3-5) What questions will be answered to provoke higher order thinking and include Moderate to High FCAT Complexity Levels? What would the ideal student response be for each question?		
	• Why does science require classification systems like the one in place? (to allow us to keep track of all of the species we have identified as well as help us to identify new organisms and the relationships between them) • How can we use our knowledge of the kingdoms to compare two species? (the basic fundamental characteristics of the kingdoms allow us to make major comparisons between two organisms if they are in the same species and allow us to view major differences if they reside in different kingdoms) • How do we decide what kingdom a newly identified species belongs to? (we can do this using the main characteristics of the organism as well as any markers of evolutionary relationships to previously identified species)		
LESSON CYLCE	**BELLRINGER** Follow the Focus Calendar to provide reinforcement of previously taught skills.		**TIME** Approximate
	A slide containing the following questions will be projected on the board for the students to copy the answers to in their notebooks and answer within the first few minutes of class: 1. What is the difference between a eukaryote and a prokaryote? 2. What is the difference between autotrophs and heterotrophs? 3. We often think of plants when we hear the term cell wall. What other type of organism do you think might contain cell walls in its cells?		*10 min*
	INTRODUCTION Brief part of the lesson when students learn the objective/essential question and how mastering the objective leads to achieving the bigger goal of the course. • Provide a hook to motivate students and link to prior knowledge in order to introduce a new concept. • Explain the relevance of lesson and the importance of learning the concept. • Introduce important vocabulary using the word wall as an interactive learning tool.		*25-30 min*
	Classification PowerPoint • Students choose numbers from the home slide which leads to a respective slide • Each slide contains information on an organism that gives clues which allow the students to guess the kingdom • The name of the kingdom remains revealed until correctly guessed and then is animated to enter the screen		

- Clicking the ‘home’ in the bottom corner brings the presentation back to slide one for students to pick another number





Eubacteria



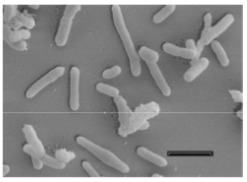
Does NOT live in extreme environments!

Animalia

Ursus arctos – Brown bear

Organism A is autotrophic, single celled, and eukaryotic.

Protista



Alicyclobacillus acidocaldarius

- Thrives in acidic conditions
- Prokaryotic

Archaebacteria

Saccharomyces cerevisiae

- Eukaryotic

Fungi

Sabal palmetto

Plantae

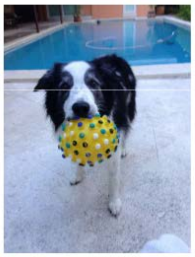
Plantae

Moss (one variety)

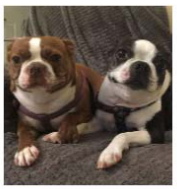
- Multicellular
- Autotrophic

Organism B is multicellular, heterotrophic, and has cell walls containing chitin.

Fungi



Animalia

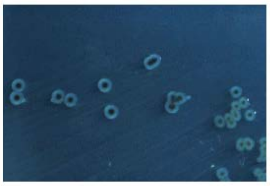


Canus lupis familiaris

Organism C is unicellular, heterotrophic, and lives on the ocean floor.

Archaebacteria

Salmonella enterica



Eubacteria

- Unicellular
- Prokaryotic

Organism D is multicellular, has no cell walls, and is heterotrophic.

Animalia OR Protista

MODELING *"I DO"*

Component of the lesson when teacher explicitly models to students exactly what they are expected to do during guided practice and eventually during independent work.

- Conduct a think aloud while modeling the steps to completing an activity or solving a problem.
- Model the use of a graphic organizer.

Use questioning techniques such as re-directing, wait-time and prompting.

An explanation of the We Do will be given. Students will be given envelopes of the headings in the chart listed in the We Do and will be also given pictures and words to fill out the chart with by spreading them out on their desk and making a large, rearrangeable chart. Students will be instructed to work in pairs on this activity.

GUIDED PRACTICE *"WE DO"*

Guide students to independent practice by providing an opportunity to work in small groups and practice what was taught during the modeled portion of the lesson.

- Incorporate the use of a collaborative strategy in small groups.
- Encourage student accountable talk during group discussion.

Perform checks for understanding.

Kingdom	Heterotrophic or Autotrophic	Unicellular or Multicellular	Eukaryotic or Prokaryotic?	Cell Wall?	Method of Obtaining Nutrition	Examples of Organisms
Animalia						
Plantae						
Fungi						
Archaebacteria						
Eubacteria						
Protista						

Heterotrophic	Multicellular	Eukaryotic	No	Ingestion
Autotrophic	Multicellular	Eukaryotic	Yes, made of cellulose	Photosynthesis
Heterotrophic	Multicellular	Eukaryotic	Yes, made of chitin	Decaying material
Both	Unicellular	Prokaryotic	Yes	Varies
Both	Unicellular	Prokaryotic	Yes	Varies
Both	Unicellular	Eukaryotic	Usually no	Varies


Insects


Dandelion


Mold


Found in extreme conditions


Streptococcus


Amoeba

	COLLABORATIVE PRACTICE *"THEY DO"* Guide students to independent practice by providing an opportunity to work in small groups and practice what was taught during the shared portion of the lesson. • Incorporate the use of a collaborative strategy in small groups. Circulate throughout the room and provide guidance to each group as needed.	
	Following an approval of their answers, students will now copy the chart they have produced into their notebooks to keep for reference.	
	INDEPENDENT PRACTICE *"YOU DO"* Differentiate your instruction to reach the diversity of learners in your classroom. • Assign students independent work that is directly aligned with the "I Do" and "We Do" portions of the lesson. • Conduct Center Rotations • Circulate around the room to provide individual support. Pull small groups or individuals for more intensive support.	
	Students will now be given two of the kingdoms to compare and create a Venn diagram comparing and contrasting them. Diagrams will be drawn both on whiteboards and in the students notebooks. Following the creation of the charts, students will get up in front of the class and present their work as well as compare their work with other pairs that share similar kingdoms.	
	CLOSURE Wrap up the lesson and help students organize the information learned into a meaningful context. • Have students reflect on or answer the Essential Question. • Help students connect today's learning to their bigger goal in the course.	
	Following the presentations, we will have a short discussion as to why the establishment of kingdoms allows us to make these comparisons so easily. We will once again summarize the main characteristics that are considered when placing a species into a kingdom, and how useful classification as a whole is a useful and necessary system to science.	
	HOME-LEARNING • How will students practice what they learned? How will opportunities be provided for students to maintain mastery of previously mastered skills/concepts?	
	Students will review their two charts at home to recall the characteristics of the kingdoms and can use the main table frequently as a reference, especially when preparing for the next assessment.	