Ashley Grapes

Unit Plan: Protists and Fungi

Day	Lesson	NSTA Standards	Virginia SOL's	Activities	Assessments
1	**Intro to Protista**	**C1.5, C2a.5, C2a.17**	**BIO 1.j; BIO 4.b**	**Engage:** Identifying protists; **Explore:** Webquest – protists in our daily lives	**KWL start** **Activity Sheet**
2	**Characteristics and Anatomy of Protista**	**C1.5, C2a.2, C2a.3**	**BIO 2.a; BIO 4.a** **BIO 4.b; BIO 5.a.b.c.d**	**Explain:** PPT and guided outline, compare and contrast chart	**Activity Sheet**
3	**Reproduction of Protista**	**C1.5, C2a.2, C2a.3**	**BIO 4.b; BIO 5.a.b**	**Explain:** PPT & concept map**,** embedded videos and games	**Mini Quiz** **Concept Map**
4	Video on Protista	C1.5, C2a.2	BIO 4.b, BIO 5.a.b.d	Elaborate: worksheet, crossword	Mini Quiz
5	**Protista anatomy lab**	**C1.5 C2a.2**	**BIO 1.a** **BIO 4.b**	**Elaborate:** Identifying Protista Lab, coloring Protista anatomy worksheet	**Mini Quiz** **Activity Sheet**
6	**Intro to Fungi Characteristics of all fungi**	**C1.5, C2a.2, C2a.5,**	**BIO 1.j; BIO 5a.b.c.d** **BIO 4.b**	**Engage:** Fungi Fun Facts **Explore:** 6 ways fungi can save the world **Explain:** PPT on characteristics	**Video sheet**
7	**PowerPoint on Fungi**	**C1.5, C2a.2, C2a3**	**BIO 4.b; BIO 5a.b.c.d**	**Explain:** the four phyla and anatomy **Elaborate:** Video	**Mini Quiz on characteristics** **Video sheet**
8	**Fungi anatomy lab**	**C1.5, C2a.2**	**BIO 4.b; BIO 5a.b.c.d**	**Elaborate:** Lab and activity sheet	**Lab sheet**
9	**Seeing the big picture: concept maps**	**C1.5, C2a.5, C2a.17**	**BIO 2.e; BIO5.e** **BIO 4.b**	**Write fungi concept maps** **Write protist concept maps**	**Mini Quiz** **Fungi concept map**
10	**Unit Test Review**	**All Above**	**All Above**	**Test Review:** Jeopardy game Fill out review sheet	**Activity sheet completions**
11	**Protista & Fungi Test**	**All Above**	**All Above**	**Evaluate:** Unit Test	**Unit Test, KWL finish** **Fungi activity sheets in**

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Protist Unit Lesson Plan

Duration: Five 50 minute classes

Purpose:

The purpose of this unit is to teach the national and state standards of kingdom Protista in a way that fully engages students, results in long-term retention of the content, and continues to improve the scientific literacy of the students. The following week long lesson plan incorporates multiple approaches to learning, including reading and comprehension strategies, visual aids, art, hands-on lab experience, and inquiry-based assignments. The progress of student learning will be closely monitored on a daily basis in order to evaluate student progress and uncover misconceptions before the capstone assessment.

SOL's: BIO 1.j; BIO 4.b, BIO 2.a, BIO 4.b and all of BIO 5.

National Science Standards: C1.5, C2a.2, C2a.3, C2a.5, C2a.17

Materials:

Live protists (paramecium, euglena, amoeba, diatoms, slime mold, algae, dinoflagelletes)
Microscope
Microscope slides
Poster Board
Colored Pencils
Video on protists
Computers

Resources:

Biggs, Alton, C. Kapicka, L.Lundren. 1995. Biology: The Dynamics of Life. Glencoe, McGraw-Hill. ISBN 0-02-826647-1
Biology: The Science of Life: Microscopic World. 2002. Discovery Education. Video.

Safety:

Students should not ingest the live protists.

The webquest requires some level of trust from the teacher even though the students are required to google the headings exactly as written. A blocker should still be set-up on computers.

Procedure:

5-E Section	Time Frame	Description	Assessment
Engage Day 1	5-10 minutes	Show the student's a PPT slide with different types of protists on it, from large kelp to small diatoms, and ask them to determine which ones are protists. Explain afterwards that protists are the most diverse kingdom of the six they will learn, and out of all the kingdoms, scientists are most dissatisfied with the classification of protists as it is a "catch-all" kingdom.	None
Explore Day 1	40 minutes	Hand out the webquest worksheet. Allow students to get excited about the importance of protists by giving them "freedom" to explore the headings provided on Google. Tell the students that they can research 3 of the 6 headings, with approximately 10 minutes per heading. After ten minutes have an open discussion about the headings Which one was their favorite? Which one was most surprising? Show a short youtube video for each heading.	Webquest Sheet
Explain Day 2	50 minutes	Give a PPT on the classification, diversity, general characteristics, and anatomy of fungus-like protists and plant-like protists. Ask the student's to take notes. Make sure to embed videos and images so students can visualize the material. If time allows hand-out "class-copies" of the notes for students to write what they may have missed during the presentation.	
Explain Day 3	50 minutes	Give an open note, 5 question quiz on the material presented the previous day. Give a PowerPoint on animal-like protists. When they are done, ask the student's to start the "protist study guide" using their notes.	Mini quiz; Protist study guide
Elaborate Day 4	50 minutes	Give a mini quiz on animal-like protists Hand out a video worksheet guide, and allow the students 10 minutes to fill in any information they can without the help of the video Watch the video and ask the students to answer all the questions	Mini quiz Video guided worksheet
Elaborate Day 5	50 minutes	Give an open note mini quiz on the material presented the previous day. Hand out the lab worksheet. This lab will be designed as timed stations, where each group will be given 5 minutes per station. Each station will be accompanied by 2-3 short response questions and the students will be asked to label anatomical structures on a picture. These stations are set-up as follows: animal-like, plant-like, fungus-like, mystery protists 1, mystery protists 2	lab activity sheet
Elaborate Day 6	50 minutes	Practice a concept map with the class Give a closed-note mini quiz on protist anatomy. Students will be asked to make their own concept map in partners on a poster board with the aid of a vocabulary list. Once the class is done making concept maps they will walk around the room and look at the other graphic organizers made by their peers. They will then get to choose which concept map they like the best and copy it down for their notes.	Mini quiz
Evaluate 7	30 minutes	The students will be given a test on the week's material. The test will include drawings, diagrams, labeling, fill in the blank, short answer, true and false, and multiple choice. When the students are finished their test, ask them to fill in their KWL section, "what I have learned"	**Test** **KWL**

Ashley Grapes
Fungus Unit
Duration: Six 50 minute classes

Purpose:

The purpose of this unit is to teach the national and state standards of kingdom Fungi in a way that fully engages students, results in long-term retention of the content, and continues to improve the scientific literacy of the students. The following week long lesson plan incorporates multiple approaches to learning, including reading and comprehension strategies, visual aids, art, hands-on lab experience, and inquiry-based assignments. The progress of student learning will be closely monitored on a daily basis in order to evaluate student progress and uncover misconceptions before the capstone assessment.

SOL's: BIO 1.j; BIO 2.a; BIO 4.a.b, BIO 5.a.b.c.d.e

National Standards: C1.5, C2a.2, C2a.3, C2a.5, C2a.17

Materials:

Live fungi for the 4 kingdoms is possible
Poster Board
Yogurt, cheese, bread
Lichens if possible
Colored pencils
Computer

Safety measures:
All ordered fungi should be labeled safe to handle, and if possible, kept in sealed jars
Yeast and molds should not be handled, but sealed in a petri dish
Hands should be washed before eating food

Resources:
Stamets, Paul. "6 Ways Fungi Can Save the World." 2008. Video.
Life Science: Protists and Fungi. 2002. Video.
Biology: The Science of Life: The World of Fungi. 2002. Video.

Procedure:

5-E Section	Time Frame	Activities	Assessment
Engage Day 1	5-10 minutes	Fungi Fun Facts: The largest organism in the world is a fungus, the most poisonous fungus, foods made by fungus (yeast)	
Explore Day 1	15-20 minutes	Show the video, "6 Ways that Fungi can Save the World" to allow students to see the importance of fungi to the environment	Video Sheet
Explain Day 1	10-15 minutes	Give a powerpoint on the common characteristics of fungi	
Explain Day 2	30 minutes	Give a mini quiz on the characteristics of fungi. Give a powerpoint on the four phyla of fungi, relationships fungi make with algae and plant roots, and the benefits and harm caused by fungi. The students may choose to copy down the notes from a class-copy and begin to fill out their fungi study guide sheet	Mini Quiz Fungi Study Guide
Elaborate Day 3	40 minutes	Give a mini quiz Hand out a video worksheet guide, and allow the students 10 minutes to fill in any information they can without the help of the video Watch the video and ask the students to answer all the questions	Mini Quiz Video Study Guide
Elaborate Day 4	50 minutes	Give an open note mini quiz on the material presented the previous day. Hand out the lab worksheet. This lab will be designed as timed stations, where each group will be given 5 minutes per station. Each station will be accompanied by 2-3 short response questions and the students will be asked to label anatomical structures on a picture. These stations are set-up as follows: each phyla is a different station, lichens, and yeast made food	Lab Activity Sheet
Elaborate Day 5	50 minutes	Give a closed-note mini quiz. Students will be asked to make their own concept map in partners on a poster board with the aid of a vocabulary list. Once the class is done making concept maps they will walk around the room and look at the other graphic organizers made by their peers. They will then get to choose which concept map they like the best and copy it down for their notes.	Mini Quiz Concept map poster
Evaluate Day 6	30 minutes	The students will be given a test on the week's material. The test will include drawings, diagrams, labeling, fill in the blank, short answer, true and false, and multiple choice. When the students are finished their test, ask them to fill in their KWL section, "what I have learned"	Unit Test

Assessments for Unit Plan

**** Fungus assessments follow same pattern as protist assessments****

Protist Webquest:

	1	3	5
Completion of questions	0-2 answered	3-4 answered	All 5 answered
Effort	Average of 0-1 sentences/question	Average of 2-3 sentences/question	Average of 4-5 sentences/question
Content	Content seems off topic and irrelevant	Content answers questions half of the time	Content answers questions most of the time
Appropriateness	Student reprimanded more than twice for inappropriate use of computer	Student reprimanded 1-2 times for inappropriate use of computer	Student not reprimanded for inappropriate use of computer
Staying on task	Student reprimanded more than twice for being off task during sharing	Student reprimanded once or twice for getting off task during sharing	Student not reprimanded when sharing with a partner
Total			

Mini Quizzes:
Marked as either correct or incorrect
1 point per question x 5 questions per mini quiz x 6 total = 30 points

Protist Video:
Marked as either correct or incorrect
1 point/blank = 25 points total

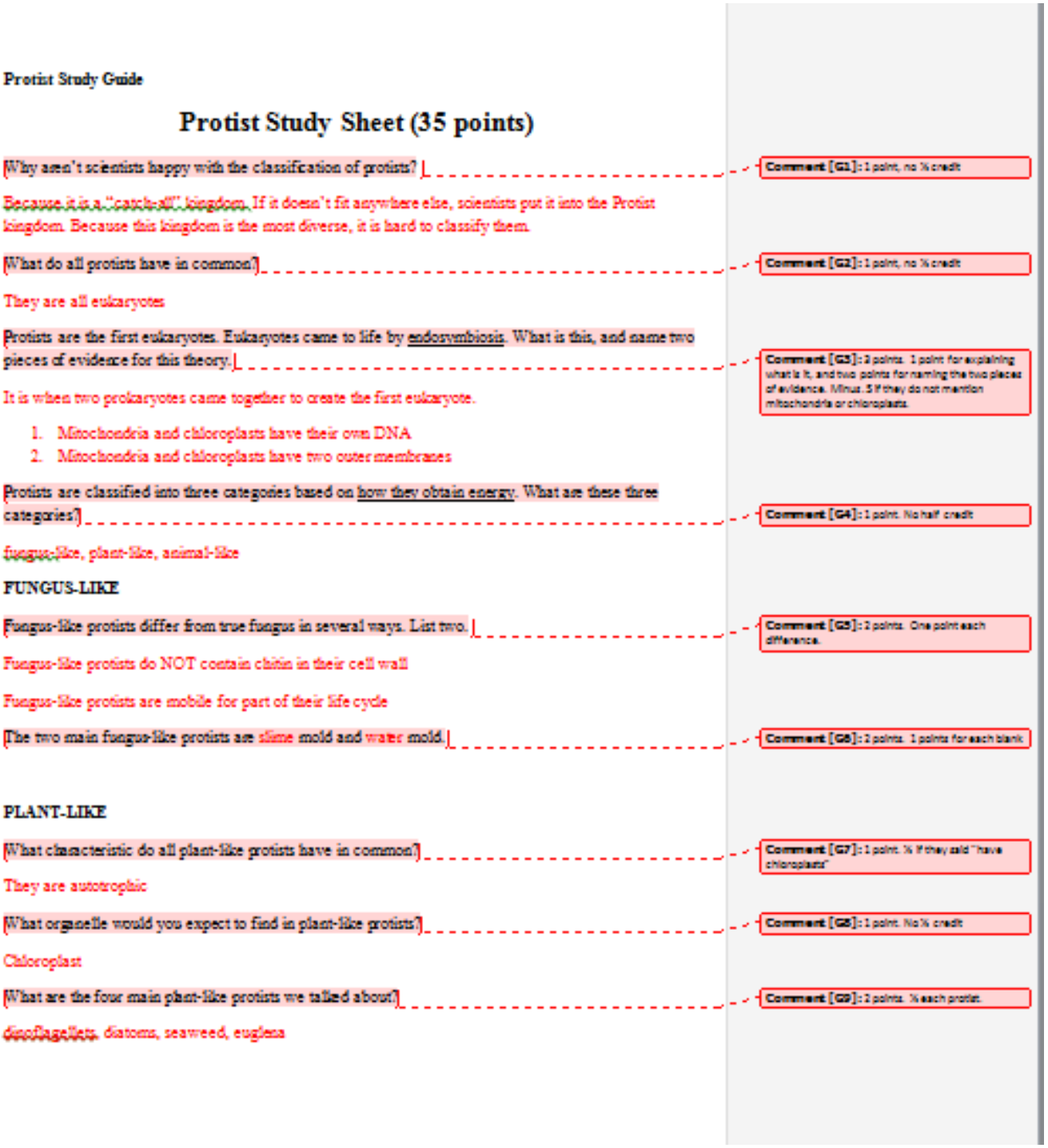
Protist Lab:

All 7 lab view pictures are drawn	1 point / drawing	7 points
Amoeba labeled and colored	1 point anatomical part	4 points
Amoeba blank questions	1 point per question	3 points
Euglena labeled and colored	1 point anatomical part	6 points
Euglena blank questions	1 point per question	5 points
Follow-up questions	1 point per phrase	4 points
Paramecium labeled and colored	1 point anatomical part	5 points
Paramecium blank questions	1 point per question	4 points
Behavior during lab/class	Minus 1 point per reprimand	7 points total
		45 points total

Concept Map:

1 point/blank = 16 points total

Protist Study Guide



Protist Study Guide

Protist Study Sheet (35 points)

(Why aren't scientists happy with the classification of protists?)

Because it is a "catch-all" kingdom. If it doesn't fit anywhere else, scientists put it into the Protist kingdom. Because this kingdom is the most diverse, it is hard to classify them.

Comment [G1]: 1 point, no ½ credit

(What do all protists have in common?)

They are all eukaryotes

Comment [G2]: 1 point, no ½ credit

Protists are the first eukaryotes. Eukaryotes came to life by endosymbiosis. What is this, and name two pieces of evidence for this theory.

It is when two prokaryotes came together to create the first eukaryote.

1. Mitochondria and chloroplasts have their own DNA
2. Mitochondria and chloroplasts have two outer membranes

Comment [G3]: 3 points. 1 point for explaining what is it, and two points for naming the two pieces of evidence. Minus .5 if they do not mention mitochondria or chloroplasts.

Protists are classified into three categories based on how they obtain energy. What are these three categories?

fungus-like, plant-like, animal-like

Comment [G4]: 1 point. No half credit

FUNGUS-LIKE

Fungus-like protists differ from true fungus in several ways. List two.

Fungus-like protists do NOT contain chitin in their cell wall

Fungus-like protists are mobile for part of their life cycle

Comment [G5]: 2 points. One point each difference.

(The two main fungus-like protists are slime mold and water mold.)

Comment [G6]: 2 points. 1 points for each blank

PLANT-LIKE

(What characteristic do all plant-like protists have in common?)

They are autotrophic

Comment [G7]: 1 point. ½ if they said "have chloroplasts"

(What organelle would you expect to find in plant-like protists?)

Chloroplast

Comment [G8]: 1 point. No ½ credit

(What are the four main plant-like protists we talked about?)

dinoflagellate, diatoms, seaweed, euglena

Comment [G9]: 2 points. ½ each protist.

Why are dinoflagellates given their name?

Comment [G10]: 1 point. No ½ credit

Di = 2 & flagellates = flagella…..they have two flagella

What are the outer shells of diatoms made of?

Comment [G11]: 1 point. No half credit. .

Silica

Euglenoids are unique because they are plant-like and animal-like. What makes them plant-like and what makes them animal-like?

Comment [G12]: 2 points. One point each. ½ for "digestion" and "green"

Plant-like – they can be autotrophic and have chloroplasts

Animal –like – they can be heterotroplic and have flagella

ANIMAL-LIKE

How are animal-like protists classified? What are the four main categories we talked about?

Comment [G13]: 2 points. 1 point for classification. ½ point/ protist.

Based on how they move. Cilia, flagella, pseudopod, parasite

Which protists are unicellular? Which are multicellular?

Comment [G14]: 2 points. Must name one unicellular protist (1 point) and seaweed (1 point)

They are all unicellular except for seaweed! So therefore, all anima-like are unicellular

On your test be able to talk about the importance of the red tide, phytoplankton, oil formation, malaria, algae biofuel

Label and know function of:

Comment [G15]: 10 points. One point each

Eyespot
Flagella
Pseudopod
Cilia
Oral groove
Contractile vacuole
Food vacuole
Nucleus
Chloroplasts
Gullet