ICE
Inquiry-based Curriculum Enhancement

UTI Instructions: Mendelian Genetics

Introduction:
In this complex instruction activity, students work together to create some representation of an aspect of Mendelian genetics. They practice communicating with peers and have the opportunity to make unique contributions to the team goal. All tasks and accountability questions are listed below.

Procedure:
1. The week before class, tell students to bring their textbook to the next meeting.

2. Introduce the activity as several different ways to look at Mendelian genetics. Divide students into the appropriate number of groups (6-7) with no more than 4 students per group.

3. Distribute the task cards to the teams. Tell them that everyone should read the card, and then they should collaborate on the task. Every member of the team must be involved in the task. Announce that they have ten minutes to prepare their presentation (this announcement warns groups that they must work on task and collaboratively in order to finish).

4. Circulate among the groups, answering any questions. Encourage creativity in the teams by supporting the ideas about which students ask. Particularly provide encouragement for students utilizing 'alternative' strategies to complete the task. Allow the teams to develop their own presentation without pushing in a particular direction. Provide a two-minute warning at the appropriate time (this depends on the number of groups*).

5. Have teams make their presentation to the class. Note any particularly meaningful episodes in the presentations.

6. In the final five minutes of class, distribute the Individual Accountability cards to the teams. Have each student write a response to the question. Collect responses as students leave. Comment positively on various contributions. The student responses should be marked for thoughtfulness rather than for correctness.

* Allow five minutes for each group to give their presentation and five minutes for the individual accountability exercise. If your discussion has 6 groups, then you should allow 35 minutes to complete the presentations and accountability exercise. This requirement means that the groups will receive less time to prepare their presentation. Be particularly mindful of the time, as you want each group to present (it is possible that students will view the exercise as a waste if they don’t get to share their task).
Task: Campaign Consultants
Your team has been hired to write an advertising campaign in support of Mendel’s laws. The client (Genes-R-Us) wants two 30-second ads for each law, to be played on the radio. Create these ads and be ready to present the campaign to the class.
Individual Accountability:
Do you think there are any fundamental differences between Mendel’s two laws? How do any differences influence the application of Mendel’s laws to genetic problems?

Task: Mendel’s Words Game Show
Congratulations! You have been selected to participate on the Mendel’s Words Game Show. All of the questions on this show are about the vocabulary of Mendel’s genetics. Design a skit of this show and be ready to enact your game show to the class. You choose the words and categories.
Individual Accountability:
In your opinion, is all of the terminology scientists use to describe genetics really necessary? In five sentences or less, explain your answer.

Task: Team TEST
Your team has been hired to create test questions about Mendelian genetics for the MCAT and GRE. Specifically, you are to focus on probability in solving genetics problems. Create five mind-bending questions that could be used in these tests. Be prepared to present your questions to the class (and have answers!).
Individual Accountability:
Do you feel that probability is necessary for understanding Mendelian genetics? Explain your answer is five sentences or less.

Task: The Mad Scientists
You are members of a scientific team researching the influence of environment on human phenotype. Design the perfect experiment to finally determine how important environmental influences are on human form and function, and prepare the oral presentation you will give to your funding agency. Be ready to present and defend your experimental design to the class.
Individual Accountability:
Do you think that environment is or has been very important in determining your phenotype? Why or why not?

Task: The Great Debate
Create a skit that presents the dual meanings of the words phenotype and genotype (the reductionist view and the organismal view). Be ready to present your skit to the class.
Individual Accountability:
Do you think that one view of phenotype and genotype is more appropriate than the other? Explain your answer in five sentences or less.

Task: Ethical Dilemma
Your team has been asked to create ethical rules for the use of results from genetic screening. Civil liberties groups are picketing your offices since they feel that genetic information belongs to the individual only. Insurance lobbyists and biotech companies are picketing because they want access to individual genotypes for insurance rates and for possible use in developing new treatments or tests. Create a statement that presents guidelines for use of results from genetic screening, and that addresses both perspectives. Be prepared to present your statement to the class.
Individual Accountability:
In your opinion, are there any undeniable rights of individuals over their genome? When can an insurance agency or biotech firm have access to your genetic information? Explain your answer in five sentences or less.