BROOKLYN TECHNICAL HIGH SCHOOL R. ASHER, PRINCIPAL

SCIENCE DEPARTMENT T. EVANGELIST, AP, SCIENCE

STANDARD 4

KEY IDEA 1

Performance indicator 1.2 Describe and explain the structures and functions of the human body at different organizational levels ( e.g., systems, tissues, cells, organelles ).

Major understanding 1.2f Cells have particular structures that perform specific jobs. These structures perform the actual work of the cell. Just as systems are coordinated and work together, the cells making up those systems must also be coordinated and organized in a cooperative manner.

Major understanding 1.2i Inside the cell, a variety of specialized structures, formed from many different molecules, carry out the transport of materials, energy capture and release, protein building, waste disposal and information storage.

Performance indicator 1.3 Explain how a one celled organism is able to function despite lacking the levels of organization present in more complex organisms.

Major understanding 1.3a

ENGLISH LANGUAGE ARTS STANDARDS

E2: Writing E2a

E3: Speaking, Listening, and Viewing E3b, E3c

ESSENTIAL CONTENT

1. Relate the structure and function of the parts of a typical cell.

2. Compare and contrast plant and animal cells.

ESSENTIAL SKILLS

1. Thinking skills : critical thinking, analyzing, interpreting, comparing / contrasting

2. Production skills : writing, creating a cell, researching.

3. Support skills : cooperative learning, reading, writing.

REVIEW

Think-pair-share teams of 2 will be formed. Photographs of a cell as seen under an electron microscope, showing many cell organelles will be distributed. Students will speculate as to the reasons why there are so many cell parts, and what the parts do . Compare the cells with their own bodies - why are there so many different parts in a body ? (Page 76 in the textbook )

S2 Life Sciences Concepts S2a

S4 Scientific Connections and Applications S4a

S5 Scientific Thinking S5d, S5f

ORIENTATION

Ask students what services Brooklyn or Staten Island needs to function properly ( i.e.. sewage treatment plant, garbage disposal, roads, city hall, power plants, waterways, etc. ) Compare these necessary functions to the life functions that a cell must carry on. What parts must a cell have in order to survive ?

Life Sciences Concepts S2a

S4 Scientific Connections and Applications S4a

Scientific Thinking S5c, S5d, S5f

PROCESS

Production

Each group will be provided with the following :

\* a large piece of oak tag or construction paper, glue, markers and index cards

\* textbooks or handouts that depict the internal structures of cells

\* a wide variety of craft materials : buttons, beans, cotton balls, sequins, yarn, toothpicks, etc.

\*Students must decide which materials they will use to depict each internal cell part.

\*Each group of students will make a large drawing of the cell on oak tag and use the craft

materials for the various organelles.

\*The drawing must include labels for each of the cell part and a key on the index card(s)

\*Have a reporter from each group display and explain to the class their drawing of a cell

S2 Life Sciences Concepts S2a

S4 Scientific Connections and Applicaitons S4a

S5 Scientific Thinking S5c, S5d, S5f

S6 Scientific Tools and Technologies S6a, S6d

S7 Scientific Communication S7a, S7d, S7e

Process

Parts- to - whole worksheet. Students will be given instructions as to the use of this Ventures in Learning worksheet. They will work individually on their sheet, sharing information in teams of 2.

S2 Life Sciences Concepts S2a

S4 Scientific Connections and Applications S4a

S5 Scientific Thinking S5d

S6 Scientific Tools and Technologies S6d

EVALUATION ( can also be used as homework)

1. Worksheet - The Cell is Like a City - This activity will help students to understand that coordination in the running of a city lead to it functioning well. This should be related to the coordination among the parts of the cell that lead to the survival of the cell.

2. How might one type of cell, such as a muscle cell, differ from another, such as a leaf cell ?

( See Previous Science Performance Standards )

Homework