

## TOPICS AND CONCEPTS OVERVIEW

### THE BIOLOGY

#### THE ADVENT OF CELL THEORY

- the cell is a fundamental unit of structure, function and organization in all living organisms.
- new cells are formed from other existing cells.

#### DISCOVERING HEREDITY

- Traits pass from parent to offspring with observable and conserved patterns of function and organization in all living organisms.
- All life is descended from a common ancestry through a process of change and adaptation called Natural Selection.

#### THE MOLECULE OF HEREDITY

- DNA is the material that transfers genetic characteristics in all life forms
- the genetic information of DNA is encoded in the sequence of the bases A, T, C, G.
- the Central Dogma of Biology.

#### THE GENOMICS REVOLUTION

- DNA sequencing
- genetic databases
- whole genome analysis

### THE TECHNOLOGY

#### ADVANCEMENTS IN TECHNOLOGY FUELED ADVANCEMENTS IN RESEARCH

- The printing press
- The industrial revolution
- The computer
- The internet

#### THE TOOLS OF BIOLOGY

- Historic microscopes
- The compound microscope
- Problem solving & deduction
- The scientific method
- Using genetic databases

### THE HISTORY

#### THE SCIENTISTS

- Experience the work of 14 scientists - their contributions and the effect of the social, political, and cultural environments in which they lived, and how that shaped their research.

#### THE RESEARCH

- Users explore pivotal discoveries that laid the foundation of our current understanding of biology, and our place in the global ecosystem.
- The role of women in some of the greatest discoveries.

#### CURRICULUM

- Aligned with core senior high school and intro university/college biology curriculums
- Built in teacher support and lesson plans

### THE ISSUES

#### THE ETHICS

- Is anyone asking, “should we be doing this work?”
- Did Gregor Mendel ‘fudge’ his data? Why would he do such a thing?
- Do scientists today ever fake data? Why would they do such a thing?

#### THE SOCIAL ISSUES

- What impact does research have on me and my life?
- Will we ever be able to engineer people?

#### THE POLITICAL ISSUES

- Do governments influence research?
- Should laws be written to guide ethical research?
- Should politicians dictate science funding?

#### THE CULTURAL ISSUES

- Cultural beliefs and scientists. EXPAND
- Impacts globally/locally