

**Source:**

## **1 | rand ideas in other sciences**

**1.1 | theory of matter**

**1.2 | big bang theory**

**1.3 | newtons laws**

**1.4 | conservation of matter / energy**

**1.5 | cell theory**

**1.6 | evolution**

**1.7 | math**

**1.7.1 | finding relationships (abstract things)**

## **2 | what do those grand theories do?**

**2.1 | describe invariant relationships like  $E=mc^2$**

**2.2 | define limits on what is possible and what isn't**

**2.3 | emergent properties from computational systems that are difficult to predict**

## **3 | how does computing let us do similar things to laws and theories in science?**

## **4 | computational complexity theory**

**4.1 | how long it takes to compute the answer as a function of the input size**

**4.2 | overview of presentation**

**4.2.1 | methods for determining computational complexity**

**4.2.2 | wide variation in complexity of diff problems**

**4.2.3 | computationally hard problems are very difficult**

**4.2.4 | some problems have not yet been proven**

**4.2.5 | problems have been grouped into equivalence classes**