

ATLANTA  
SCIENCE  
FESTIVAL

<b>Lesson Title</b>	An Introduction to Biometrics
<b>Grade Band</b>	High School Biology or Forensics
<b>Submitted by</b>	Donna Barrett, Metro RESA
<b>Georgia Performance Standards:</b>	
<p><b>SCSh7. Students analyze how scientific knowledge is developed.</b> Students recognize that: b. Universal principles are discovered through observation and experimental verification.</p> <p><b>SB2. Students will analyze how biological traits are passed on to successive generations.</b> f. Examine the use of DNA technology in forensics, medicine, and agriculture.</p>	
<b>Safety Considerations:</b>	
<p>This collection of biometric data is controversial topic laden with ethical concerns – be sure to read all articles and resources prior to having students read them.</p>	
<b>Materials &amp; Time Required:</b>	
<p>1-2 day to complete the activity from Try Engineering Optional: write persuasive arguments or debate the ethics of using biometric data</p>	
<b>Lesson Logistics (for teacher):</b>	
<p>Lesson is from: <a href="http://tryengineering.org/lesson-plans/hand-biometrics-technology">http://tryengineering.org/lesson-plans/hand-biometrics-technology</a></p> <p>There is a Power Point presentation on the website that provides an introduction to the activity and biometric data.</p> <p>Lesson focuses on engineering applications of biometric technologies for identification or security applications. After exploring hand geometry biometrics, students work in teams of "engineers" to evaluate pros and cons of incorporating a hand recognition biometric technology into a new security system for a museum.</p> <p>Biometrics 101 (provides an introduction to the technologies): <a href="http://www.biometrics.dod.mil/References/Tutorial/Default.aspx">http://www.biometrics.dod.mil/References/Tutorial/Default.aspx</a></p>	

*This material is created and submitted by individual authors as recommended lesson plans to incorporate engineering design challenges and to review key science concepts. Any opinions, findings, and conclusions or recommendations expressed in this material are those of the author(s) and do not necessarily reflect the views of the Atlanta Science Festival. For more info about the Atlanta Science Festival, visit <http://AtlantaScienceFestival.org>*

Additional articles or websites that provide additional information about biometric data including some of the controversies surrounding this technology.

Article from USA Today: <http://www.usatoday.com/story/news/world/2014/04/19/ozy-biometric-identification/7904685/>

Article from Scientific American: <http://www.scientificamerican.com/article/biometric-security-poses-huge-privacy-risks/>

<b>Opening: ENGAGE</b>	<p>What is biometrics?</p> <p>Brainstorm the different types of biometric data that is or could be collected. These include: retinal scans, facial recognition, DNA, fingerprints, etc.</p> <p>Applications today: iPhone 5's fingerprint scanner</p>
<b>Work Session: EXPLORE/EXPL</b>	<p>Engage students in the task from Try Engineering. Students will measure four points (see datasheet below) on their hands and create an algorithm by which you can:</p> <p style="padding-left: 40px;">Accept an unknown sample and match is to an entry in your database Or, reject the sample as not appearing in the database at all</p>
<b>Closing: EXTEND/EVALUATE</b>	<p>Extend: (optional) – discuss the current use and potential uses of biometric data; develop a persuasive argument for or against the use of biometric data; or debate the use of biometric data as a class</p> <p>Evaluate: Write an explanation for how biometric data is currently being used. Include an explanation of why it is important to be aware of how this data is being used.</p>

**Documentation of Resources:**

Lesson is from: <http://tryengineering.org/lesson-plans/hand-biometrics-technology>

Biometrics 101: <http://www.biometrics.dod.mil/References/Tutorial/Default.aspx>

Biometrics: <http://www.biometrics.dod.mil/>