

*BABEC is in the process of moving our lessons to follow NGSS. In this workshop, we will give examples and resources to help you utilize phenomena and modeling in pGLO transformation. The handout that summarizes our workdays on NGSS (Re-envisioning Bacterial Transformation for NGSS) gives you ideas on how pGLO transformation can be used within your own scope and sequence. BABEC thanks all the teachers who participated in this process! Do not hesitate to contact us at [babec@babec.org](mailto:babec@babec.org) if you have comments or questions regarding lesson.*

## Resources for Using Phenomena

Examples of phenomena	<a href="http://www.ngssphenomena.com/">http://www.ngssphenomena.com/</a>
Qualities of a Good Anchor Phenomenon for a Coherent Sequence of Science Lessons	<a href="http://stemteachingtools.org/assets/landscapes/STEM-Teaching-Tool-28-Qualities-of-Anchor-Phenomena.pdf">http://stemteachingtools.org/assets/landscapes/STEM-Teaching-Tool-28-Qualities-of-Anchor-Phenomena.pdf</a>
An explanation of anchoring vs lesson-level phenomena & more explanations	<a href="https://www.rubicon.com/ngss-using-phenomena-engage-students/">https://www.rubicon.com/ngss-using-phenomena-engage-students/</a>
Teaching Channel's – 6 steps to coming up with engaging phenomenon to anchor your next NGSS unit	<a href="https://www.teachingchannel.org/blog/ausl/2015/04/15/6-steps-to-coming-up-with-an-engaging-phenomenon-to-anchor-your-next-ngss-unit/">https://www.teachingchannel.org/blog/ausl/2015/04/15/6-steps-to-coming-up-with-an-engaging-phenomenon-to-anchor-your-next-ngss-unit/</a>
Using phenomena?	<a href="https://www.teachingchannel.org/videos/using-phenomena-achieve">https://www.teachingchannel.org/videos/using-phenomena-achieve</a>
Model for planning phenomena 5e	<a href="https://drive.google.com/file/d/0B30VTSCDrw5TZHNvX1InUTVFNik/view?pli=1">https://drive.google.com/file/d/0B30VTSCDrw5TZHNvX1InUTVFNik/view?pli=1</a>

## NGSS Resources web sites

San Diego County Board of Education	<a href="https://ngss.sdcoe.net/">https://ngss.sdcoe.net/</a>
CA's Next Gen Science page	<a href="http://www.nextgenscience.org/california">http://www.nextgenscience.org/california</a>
CA Dept of Education	<a href="http://www.cde.ca.gov/pd/ca/sc/ngssintrod.asp">http://www.cde.ca.gov/pd/ca/sc/ngssintrod.asp</a>
NSTA Learning Center	<a href="https://learningcenter.nsta.org/products/symposia_seminars/NGSS/webseminar.aspx">https://learningcenter.nsta.org/products/symposia_seminars/NGSS/webseminar.aspx</a>
Equip rubric for science	<a href="http://www.nextgenscience.org/sites/default/files/EQUIP%20Rubric%20for%20Science%20v3.pdf">http://www.nextgenscience.org/sites/default/files/EQUIP%20Rubric%20for%20Science%20v3.pdf</a>
Stem Teaching Tools	<a href="http://stemteachingtools.org/">http://stemteachingtools.org/</a>
Example Storylines	<a href="http://nextgenscience.org/resources/example-storylines-ngss-topic">http://nextgenscience.org/resources/example-storylines-ngss-topic</a>
Graphics for NGSS alignment	<a href="https://www.materialsworldmodules.org/index.php/assessment-and-standards-alignment/ngss-alignment">https://www.materialsworldmodules.org/index.php/assessment-and-standards-alignment/ngss-alignment</a>
State of Georgia's NGSS page	<a href="http://www.georgiascienceteacher.org/Next-Gen-FAQs">http://www.georgiascienceteacher.org/Next-Gen-FAQs</a>

## Fluorescent Proteins Background and Resources

Creatures of Light – used in class	<a href="https://www.youtube.com/watch?v=qjmaQ9QvF98">https://www.youtube.com/watch?v=qjmaQ9QvF98</a>
Jellyfish Aequorea Victoria 1:22	<a href="https://www.youtube.com/watch?v=NfElp2UJC6k&amp;list=PLelrOCutXamPbo8gh9yqvel1Y7dTeyuh3&amp;index=7">https://www.youtube.com/watch?v=NfElp2UJC6k&amp;list=PLelrOCutXamPbo8gh9yqvel1Y7dTeyuh3&amp;index=7</a>
Cell movement	<a href="http://www.cellimagelibrary.org/images/7762">http://www.cellimagelibrary.org/images/7762</a>
Fluorescent Probes-iBiology	<a href="https://www.youtube.com/watch?v=gSGq8gOLXwY">https://www.youtube.com/watch?v=gSGq8gOLXwY</a>
Roger Tsien – Microscopy Fluorescent Proteins	<a href="https://www.youtube.com/watch?v=qK9aYnklr3w">https://www.youtube.com/watch?v=qK9aYnklr3w</a>
Roger Tsien – Fluorescent Protein indicators	<a href="https://www.youtube.com/watch?v=QoRTv2qZXbY">https://www.youtube.com/watch?v=QoRTv2qZXbY</a>
A Green Light for Biology: Story of how Shimomura founded GFP	<a href="https://www.youtube.com/watch?v=Sl2PRHGpYuU">https://www.youtube.com/watch?v=Sl2PRHGpYuU</a>
Fluorescent/Bioluminescent creatures underwater	<a href="http://oceanexplorer.noaa.gov/explorations/09bioluminescence/background/eyeinsea/eyeinsea.html">http://oceanexplorer.noaa.gov/explorations/09bioluminescence/background/eyeinsea/eyeinsea.html</a>
Bioluminescence Web Page	<a href="http://biolum.eemb.ucsb.edu/organism/">http://biolum.eemb.ucsb.edu/organism/</a>
Pictures of fluorescence and bioluminescence	<a href="https://bentmedia.me/2013/01/22/fluorescence-and-bioluminescence/">https://bentmedia.me/2013/01/22/fluorescence-and-bioluminescence/</a>