

Mini LIPS Session—Misconceptions, led by Karrie Berglund Comments from Discussions

What is a misconception?

- Wrong idea
- Only partly correct
- Partial knowledge
- Oversimplification, removes key components of understanding
- Can come from pop culture
- Fake news

Where do misconceptions come from?

- Expanding gaps, filling in missing knowledge
- Misinterpretation (cause of moon phases is same as cause of eclipses—shadows)
- Parents/families
- Teachers—often handed down
- Celebrities/sports stars
- Media, especially TV
- Can come from anywhere, even from yourself
- Common sense
- From us—planetariums
- Presentation styles
- Using unfamiliar vocabulary, vocabulary that is unclear or not age appropriate
- Abstract ideas presented in tangible form
- Common language—“sunrise and sunset” imply that the sun is actually moving across the sky
- Social media, social media trolls
- False equivalency
- Debates can give merit to/legitimize silly ideas, such as “flat Earth”

What are some common misconceptions?

- Moon phases
- Reasons for seasons
- Moon landing was faked
- Aliens built the pyramids
- Mars looks as big as the moon
- Polaris is the brightest star
- Pluto is a dwarf planet because it is small
- Moon doesn't rotate, the same part is always dark
- Big Bang was an explosion from a single point in space
- Rotation and revolution are the same thing
- Planets orbit Earth
- The moon is only up at night
- Galaxies, solar system, and the universe are all the same thing
- North Star is the Christmas star
- North Star is always directly overhead
- Any three stars are Orion's belt
- The Big Dipper is a constellation
- There is a morning star or evening star
- You need a telescope to see the planets

- Telescopes are magnifiers rather than light buckets
- Astrology
- Cosmetology = cosmology

How can we get rid of misconceptions?

- Build a body of evidence that does not support the misconception
- Identify what the misconception is and its source
- Google Scholar/other resources to help identify common misconceptions, especially for a particular age group
- Reframe as a “preconception” rather than misconception and build on what is correct
- Provide evidence, highlight/demonstrate the scientific process
- Work proactively with the media to share correct information

How can we avoid creating new misconceptions?

- Be concise and accurate, but...
- Don't leave out key information
- Find inaccuracies
- Identify and explain the limitations of the model you're using
- Don't overdramatize, avoid using brute force to challenge misconceptions; take a kinder, gentler approach