

Dear Families,

Our class is going to experience the Project Lead The Way module, *Stability and Motion: Science of Flight*. In this module, students design, build, and test an experimental model glider as they learn about the forces involved in flight. In addition, students apply the engineering design process to the problem of airlifting supplies to a remote area.

### Activities You Can Do at Home

We wish to maintain a collaborative relationship with families to coordinate with what we're learning in school. We encourage you to use the following resources and activities at home to support your child's learning in this module:

- To view the student course for this module, use the InKling app on a digital device, or use myPLTW.org, with the following log-in credentials:
  - Username:
  - Password:
- Visit a nearby park and experiment with balanced forces while you balance on the teeter totter.
- Design, build, and test fly a variety of paper airplanes. Discuss which paper airplane has the best flight design.
- Design, build, and test a glider model at home.

Thank you for your support in your child's learning. For more information about Project Lead The Way, please visit [www.pltw.org](http://www.pltw.org).

Sincerely,

# Dealing with Misconceptions

Throughout the Stability and Motion: Science of Flight module, students may exhibit some common misconceptions. Understanding these misconceptions will help you address them if they occur at home.

Misconception	Reality
Moving objects stop because the “force runs out”.	The moving object’s force gradually fades and eventually stops because there’s no force acting upon it. This is known as the <i>Impetus Theory</i> .
If an object is not moving, there’s no force acting on it. For example, some believe that a stationary object has no forces acting on it at all.	Objects with balanced forces acting on them may not move. Balanced forces are equal in size and opposite in direction, so an object that is at rest continues to have forces acting upon it.
An object is hard to push because it is big.	The size of an object does not indicate the amount of force needed to push or move it. For example, a large, empty cardboard box doesn’t take much force to push or pull. Whereas, a brick would take more force to push or pull.
The amount of motion is proportional to the amount of force. No force equals no motion.	Any unbalanced force (which are forces in opposite directions) in the direction of motion will cause an object to speed up and any unbalanced force opposite the direction of motion will cause an object to slow down.

## References

- Allen, M. (2014). *Misconceptions in primary science*. New York, NY: Open University Press.
- Driver, R., Guesne, E., & Tiberghien, A. (Eds.). (1985). *Children’s ideas in science*. Philadelphia, PA: Open University Press.
- Gentner, D., & Stevens, A. (Eds.). (1983). *Mental models*. New Jersey: Lawrence Erlbaum Associates, Inc.