

Parallax Tutorial Teaching and Strategy Guide

Managing equipment and parts in your classroom

Robotics and electronics kits contain a large number of parts and hardware. Organizational and management procedures will help keep recurring costs such as replacement parts down.

- 💡 Part bins or craft containers are helpful in keeping components and hardware organized and preventing loss.
- 💡 Some teachers go so far as to check out only the parts that are needed for a particular unit and require students to check them back in at the end of the lesson.
- 💡 Have spare parts on hand, because some of the small parts will inevitably be dropped on the floor and get lost, be assembled incorrectly and blow out, or wear out from extended use.

Grouping students, establishing roles, and ensuring equity

Children are born inquisitive and open to every possibility for their future. An interest in STEM/STEAM topics can motivate students to enter the types of careers that will continue to be in demand and provide living-wage jobs into the future. Unfortunately, too many female, minority, and economically disadvantaged students are reporting that they are disinterested in STEM/STEAM topics. Research has shown that this disinterest is the result of standing biases, stereotypes, and consistent messaging that convinces these students that they are not capable of succeeding with STEM/STEAM.

The best way to overcome this, and possibly to restore student interest in STEM/STEAM, is to provide students with opportunities to be successful with it, to feel safe when learning and experiencing it, and to validate and encourage any glimmer of interest they may have. Ensuring that experiences and activities are safe and successful for all students requires well thought out teaching and management strategies:

- 💡 Ensure there are enough kits for pairs of students. If that's not possible, ensure that each student in the group working with the kit has a pre-defined role and responsibility within the group.
- 💡 It is likely that within a classroom of students, there will be a broad spectrum of skills and experience with things like programming/coding and hands-on building. This variance

means the use of differentiation strategies to provide students with multiple paths for learning the content and accomplishing the tasks required of them.

- 💡 While it is tempting to group students heterogeneously to have students who better understand the content help those who don't understand it as well, this can in actuality be detrimental. It often leads those students who struggle to be intimidated and shut down with regards to the content because the students who are comfortable with the content may take over or worse, belittle their fellow students who don't understand the material as well. Instead, group students of similar levels, and as a teacher, spend more time checking in on and helping students who need more assistance with the lesson.
- 💡 Avoid whole-class competitions between students. Instead, encourage students to best their previous personal performance - acknowledge improvement.
- 💡 Facilitate discussion and opportunities for students to learn from each other's solutions to the challenges at the end of each section.