

PLEASE FIND TIPS AND HELPFUL HINTS FOR EACH SECTION OF THE WORKSHEET BELOW.

Forces and movement section

Suggestion:

You could extend the discussion here about forces and ask the students what they already know about well known forces like gravity, friction and electromagnetism. Do they have any examples of these that they can share with the rest of the class?

You could even combine the discussion with some simple exercises i.e. invite the students to have fun and jump around to demonstrate how gravity pulls them back down to the ground, experiment with electromagnetism using magnets and paper clips and try rubbing their hands together to generate friction and therefore heat.



Suggestion:

Why not expand on this section's **did you know?** fact and set up some more fun example exercises for the students to learn about forces, as well as actions and reactions.



Suggestion:

For this section's **design a parachute activity**, you could turn this into a multi-lesson project by asking students to draw out their designs and plan their experiments for discussion, before starting the 'build and test' stage.

This is a great opportunity for the students to learn about the design and planning that goes into product development, which ties in to the Digital Twin game learning experience.

Recap opportunity:

This activity provides an opportunity to revisit the national curriculum and study some force diagrams. Once you've recapped some general examples, you could ask students to apply their learning to the parachute example and draw their own diagrams to show what forces are going to be at work during their experiments.

Aerodynamics and design section

Suggestion:

You could use this section to open up a wider discussion about aerodynamic design with the class. Do the students have any interesting examples of types of aircraft, like the Concorde or an Apache helicopter, or famous car designs like Porsche or Lamborghini?

Invite discussion on design features and why they might improve the performance of an aircraft or vehicle. You could even set the students a research project into a particularly interesting design model or designer.



Suggestion:

For this section's **four forces of flight activity** why not print out the exercise and get students to cut out and match up the answers in teams, for an extra level of interactivity.

Digital twins section

Suggestion:

Digital Twin technology is fascinating but could be quite a difficult concept to grasp for KS3 students, without some real-life examples. Why not kickstart this section of the worksheet by sharing some insightful video with the class, to provide some useful context into Digital Twins?

Siemens have a great explainer video on their website with lots of visual examples of a Digital Twin at work, so feel free to share this with your students: <https://www.siemens.com/global/en/company/stories/research-technologies/digitaltwin/passion-for-digital-twins.html>

Suggestion:

Follow up with the Digital Twin game to help students solidify their new knowledge and put it into practise with an exciting challenge.

Once the students have learnt a little more about Digital Twins, why not invite them to share their initial thoughts about the technology. Do they understand it? Do they have any immediate ideas about what it could be used for?



Suggestion:

Why not add to this section's **design your own digital twin activity** and invite some interesting relevant speakers to talk to your class. They might not be able to join you in person at the moment, but a video call Q&A could be a perfect opportunity for students to learn more about Digital Twin technology or even specific areas or industries.

You could organise a speaker after the students complete this activity, to see if there are any common themes in the students ideas that might help steer who you approach. Students could even present or share some of their ideas with the speaker to get their feedback.