Is Santa Real? – Teacher Notes

Before the activity

Start with a discussion about the traditions surrounding Father Christmas, or other things we know about him. When students give suggestions, you could ask leading questions about the maths behind it.
For example,

"He delivers presents to children"
"All of them? All by himself? Wouldn't that take a long time?"

"His sleigh is pulled by reindeer"
"But wouldn't it be too heavy for just eight reindeer?"

"He lives at the North pole and elves make all the gifts"
"Can anyone else think of any problems with that?"

You might not be able to pick holes in everything they suggest, but it might be a bit of fun! It might even work as a silly debate task, with one side of the room suggesting traditions, and the other side stating why it wouldn't work. I haven't tried this though.

Presenting the activity

Students now need to more thoroughly investigate the things they've just been discussing. The task can be described to the students, and the brief can be given out for more clarity.

What if students are confused?
If the description of the task hasn't helped, and students are still confused or needing more direction, previous students' work can be shown (included). This might be worth doing regardless, as they give examples of how to present results, though it might encourage students to try and recreate the same project. **Student Example 1** was done by a pair of students of mine, and is a perfect example of how a project could be presented. **Student Example 2** doesn't have the fantastic presentation and has some iffy grammar, but is a great example of how you research or estimate lots of figures, and pull them all together to find your answer.
There are also words on the student brief which students might use for inspiration, but much of the benefit from this task comes from students deciding for themselves what to investigate, and importantly, deciding what numbers they need to research. It's not often that students are challenged with coming up with a question, and having to decide what they actually need to know to answer it.
If students have been given ample time and opportunity to decide on their own task, and genuinely seem to be struggling coming up with a question, then detailed examples of investigations are also included. These can be shown to students who are genuinely stuck, although they take away much of the independent investigation aspects, detailing exactly what information students need to be researching. Save this for students who seem out of their depth!

During the activity

It's up to you whether you'd prefer students to work independently, in pairs, or in teams, since the brief doesn't specify. Whilst students are deciding on their question or investigation, try to make sure they are asking a question they'll be able to successfully calculate or research. For example, trying to work out how far he'd travel might be beyond the scope of what students can calculate, but this *could* be something they could look up online. It may also be useful to acknowledge to students that there will be some things they can't find out, and that it's alright to make estimations.

Whilst students are doing their research and calculations, keep an eye on whether they're keeping track of everything in a document. It would be best if they're properly writing up their findings as they're going along, to ensure they produce something presentable at the end. Again, this could be in a Word Document, PowerPoint Presentation, or even an annotated Excel Spreadsheet.

If students seem to have finished their project, try to think of extension questions for their investigation. For example, if students have calculated the number of calories Santa has consumed, they could then find out what he'd need to do to burn that many calories. Depending on the planned time remaining, they could even start a new investigation.

Generally, you'll want to be doing lots of monitoring and observing, chipping in to ensure students know what they need to be looking up, and are heading in the right direction. Towards the end of the allocated time, remind students that they should be thinking about getting a document together in preparation for presenting.

Presenting the project

Students have finished their research, and now need to present their findings. Again, it's your choice about how students do this. They could present their project at the front of the group, or if this would be too intimidating, they can just put their document onto your memory stick.