Teacher notes

- This project really grew arms and legs and took 2 x 1h45 sessions in the end. If you are carrying this over more than one session you will need storage boxes/trays for each team.
- Ensure that it is a chain reaction machine being built and not just a single marble run etc.
- The children were wildly enthusiastic about this and being able to video it. Their creativity astounded me!
- Videos can be shared with class teachers, other classes, in assemblies…

STEM Challenge Project

Chain reaction challenge

Learning Intentions

- To build up our **STEM skills**:
  - Teamwork
  - Communication
  - Creativity
  - Critical Thinking
  - Resilience

- To use the **engineering design process** to solve a problem

What are your success criteria for this project?

- I would like to get better at
  - teamwork
  - communication
  - creativity
  - critical thinking
  - resilience

- How can you get better at this? Write down some strategies for yourself.

- At the end you will decide if you have been successful.

Chain reaction machine

- http://no-ads-youtube.com/video/bg-binggo/amazing-chain-reactions?v=1pl8XqIxgg4
- http://no-ads-youtube.com/video/viral-maniacs/most-amazing-chain-reaction-machine-mechanism-videos-domino-effect-rube-goldberg?v=CxunCt-rd2Y
- https://www.youtube.com/watch?v=p8Wwq_B5S7I – hints and tips

Chain reaction challenge

- Design and build a **chain reaction machine** which has as many steps as possible

- You will be given a choice of materials:
  - **Straws – max 6**
  - **Lollypop sticks – max 6**
  - **String**
  - **Foil**
  - **Card**
  - **Card boxes – variety of sizes – to be cut up**
  - **Old Sellotape rolls**
  - **Paperclips**
  - **Yoghurt pots – max 1**
  - **Marbles, balls, beanbags**
  - **K'nex**
  - **Sellotape**

- You may bring in your own items from home: dominoes max 10, balls, wind up toy, car, etc
- Test your chain reaction machine and try to improve it

Video

- Make a video of your Chain Reaction Machine – this will probably take several attempts – keep engineering to get it right!

What can you learn from others?

- **Learning loop** – look at other people's work.
- How did other groups tackle the STEM challenge?
- Which ideas did you see that were successful?
- What did you see that hadn't worked, or that you wouldn't use?

Evaluation

- Discuss how your team approached the STEM challenge
  - What did you learn?
  - Which STEM skills did you develop?

- How could you improve your design?

- Can you think of another similar STEM challenge you could set yourself to try at home?

Self-assessment at end of project

- We have been developing our STEM skills by doing STEM challenges:
  - Collaboration
  - Communication
  - Critical thinking
  - Creativity
  - Resilience

- Use a felt-tip pen to update your previous self-assessment sheet.
  - Tick the boxes to show how you feel about each STEM skill.
  - Circle the STEM skills you feel you have developed during these STEM challenges.