STRATEGIC PARTNERSHIP
AGENTS OF CHANGE IN EDUCATION

STEAM Recipe

Theme	**More Plastic Metal Cardboard please! (PMC)**
Target Age Group	11-12 years olds
Duration of Activity	100 minutes
Resources/Materials Needed (exact details required)	**The classroom** Make islands where the children can sit with 3 to 4 persons. Then make sure you have two tables, one to put all the crafting materials on and one for making a glue-gun station. **Phase 1** - Fake news article about the prohibition of throwing away Plastic Metal Cardboard (PMC) - PMC waste **Phase 2** - Film clip about the recycling of PMC Klokhuis. (2015, 23 April). *Doen ze dat zo: Hoe werkt recycling van plastic? | Het Klokhuis* [Video]. Consulted on March 10th, from https://www.youtube.com/watch?v=3c1staSTl6w **Phase 3** - A second person who is willing to play a character for your lesson. This person will run into the classroom and put on a little act. **Phase 4** - Cords (cotton, linen, elastic) - Electric tape - Tape - Iron wire - Glue gun - Drawing paper - Pencils and gums - Scissors - Cutters - Rulers - Measuring tape

	Phase 5 - Worksheets (one per group) *This is optional, I've decided to let the children write down a name for their invention as well as how it works and a target group.* - Enough white paper *To brainstorm and to make a design.* **Phase 6** - Cords (cotton, linen, elastic) - Electric tape - Tape - Iron wire - Glue gun - Drawing paper - Pencils and gums - Scissors - Cutters - Rulers - Measuring tape **Phase 7** - A police officer outfit *The teacher will walk out of the classroom and come back as a police officer.*
STEAM Components	**Science** – *the children will learn about the characteristics of PMC, how it's made and also how it can be dissolved or turned into new objects.* **Technics** – *The children will find out what they can do with PMC, how they can reform them into new objects. Also will they learn about the functionality of plastic.* **Engineering** – *The children will try to invent new objects, inventions in this case, by exploring the possibilities of PMC. They will also be experimenting with other materials, which they will be using to turn the PMC into a great invention.* **Arts** – *The children will be getting the freedom to create any invention that they have in mind. First they will make a 2D-design and then work on a 3D-design.* **Mathematics** – *They will be getting measuring instruments so they can work very precisely.*

STRATEGIC PARTNERSHIP
AGENTS OF CHANGE IN EDUCATION

WHY	**Goals/Objectives/ Targets/Aims**	For this STEAM-recipe there are two major aims: One is that they learn more about the functionality and different kinds of plastic, as well as how our society takes care of PMC-waste. They will explore themselves what the characteristics of PMC-items are by experimenting with different tools. The second one is that they start thinking about what they could possibly create to make life, depending on the target group, better or easier. They get the freedom to create something completely new. Alongside these goals, there are various little goals the children achieve during this lesson: - Subtle manoeuvring of the hands - Trying to turn a 2D-desing into a 3D-design - Writing small texts - Using different technics - Present something they've created
HOW	**Method/Activities (i.e step by step instructions for teacher)**	**Phase 1 – the article (10 minutes):** The teacher is reading an article (fake news) about how PMC-bags are not allowed anymore. All PMC-waste needs to be recycled at home, or we need to contact organisations who are still recycling PMC. The article says that throwing away PMC-waste can be punished, from low fines to 6 months of jail. After the article the teacher says that the school has lots of PMC-waste, and since we can't throw it away we need to figure out what we're supposed to do about it. First of all, we're going to explore the waste and try to find out which kinds of materials we can find in a bag of PMC. Instruction: "We're going to look closely at what's in the bag of PMC. Try to put the materials together which you think are the same. You'll get five minutes to separate the different kinds of waste that come out of this bag. Try to use all your senses when exploring the waste." Questions afterwards - Why do you think these things belong together? - What do all these objects have in common? *(they're all made with plastic)*

		- Which other materials, except for plastic, did you find? *(carton, metal)* - Who can tell me where plastic is made from? *(oil)* - Who knows how plastic is being recycled? **Phase 2 – the recycling process of PMC (10 minutes):** The teacher puts on a small video about how PMC can be recycled and also how it has been made. Questions afterwards - How did they separate the different kinds of plastic? - How can you find out what plastic is used to make a specific object like a bottle? - What happens with the plastic that has been recycled? **Phase 3 – a stranger walks in (10 minutes):** A person (this needs to be a second person who has been asked to do this) runs in the classroom with a PMC-bag. Apparently, this person is running from the police because he was trying to dump the PMC-waste in a container on the street. He doesn't have the money to pay a fine, so he is asking the children for help. When the children promise to help this person, he will stand outside to guard the door whilst the teacher and the children try to find a way to make the PMC disappear. Questions afterwards - What can we do to make the PMC go away? - Is it a possibility to make new things out of waste? - How can we create new things with PMC? **Phase 4 – experimenting with PMC-waste (10 minutes)** In this phase the teacher has made two tables: one table with all kind of crafting tools (scissors, tape, cord, glue, cutters); another table with two glue guns. The teacher will be standing by the table with the glue guns to supervise the children using them. They all get two cards with their name on. When they take something, like tape or scissors, they hand out a card with their name on. This way the teacher can find out very quickly who has which tool. Instruction: "You can all take two things out of the PMC-bag. When you take a crafting tool, you'll replace it with one of your name cards. For the glue gun you need to ask me what needs to be done. Be very careful with cut plastic and metal, these materials can be extremely sharp!

		Try to use different materials and ways to put these two objects together. You could sew them, glue them, but there are numerous ways of putting two objects together. You'll get ten minutes to experiment." Questions afterwards: - What materials did you use? - What worked really well? How so? - What didn't work at all? **Phase 5 – designing a new invention out of PMC-waste (15 minutes)** The children are being put in groups of 3 to 4 participants maximum. Together they will brainstorm what they could possibly make with the PMC-waste. They need to use their imagination and try to find something that could be a useful invention. They will write down words together on paper. When they are done, they put their hands up so that the teacher can come and hear about their ideas. The teacher will help them decide which idea they should to develop. Instruction: "You will all be writing down ideas on the same paper. When you're out of ideas, you put your hands up. I will help you pick the idea you like the most so you can start creating it with the materials from the PMC-waste." When the ideas have been approved by the teacher, the children get a form to fill in. They will write about the function of their object, how it works and who it can be useful for. They will also make a 2D-design of what they are about to make. Instruction: "When your form is filled in, nominate a group member to show it to me. When I give my approval, you can start creating your invention. The rules are still the same: when you take something, you replace it with your name card. When you need the glue gun, you come ask me for help." **Phase 6 – creating a new invention out of PMC-waste (40 minutes)** The children will now be creating the invention they have just designed. Some groups might have started earlier, but it's important to make sure they have at least 45 minutes to make their invention. The teacher will observe and guide the children in this phase, as she will also keep guard on the glue gun table. **Phase 7 – presentations (5 minutes)** The stranger walks back in and warns the kids that the police are on their way. The teacher tells the children she will try to stop him, meanwhile

		they have to hide all the PMC-waste that hasn't been used. She also tells the stranger to hide somewhere so that the police won't find him / her. Suddenly a PMC-police officer walks in (in this case the teacher) and asks the children if they have seen a stranger with a bag of PMC-waste. After that, the police officer asks if they have any PMC-waste in the classroom. The police officer sees an invention and asks the children to explain it. Each group has to explain what they had made and what it is for. After hearing out every group, the police officer leaves. Not very long after the teacher walks back in.
DID IT WORK	**Reflection/Evaluation (where applicable)**	Reflection questions for the kids: - What did you find the most difficult and why? - What went really well? Why? - What did you learn about PMC? - What did you learn about inventing things? - What questions do you still have? Evaluation of the document and the presentation: • Is there a target group? • Is the functionality of the invention clear? *You can also evaluate different things, depending on what you want to find out.*