STRATEGIC PARTNERSHIP
AGENTS OF CHANGE IN EDUCATION

STEAM Recipe

Target Age Group	Age 11-12
Duration of Activity	100’
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 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.*
Theme	More PMC please!
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 deform 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 whereupon they start working on the 3D-design.* **Mathematics** – *They will be getting measuring instruments so they can work very precisely.*

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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 all the freedom there is to create something completely new. Next to 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 of 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 they know what plastic they have to use 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 was running from the police since he was trying to dump the PMC-waste in a container on the street. He doesn't have the money to pas 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) an another table with two glue guns. The teacher will be standing by the table with the glue guns and the children aren't allowed to use these on their own. 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 needs to have what 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 to 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 make a brainstorm about what they could possibly make with the PMC-waste. Therefor they need to use their imagination and try to find something that could be a useful invention. They will write down words together on a white paper. When they are done, they rise their fingers so that the teacher can come and hear about their ideas. The teacher will eventually tell them which idea they need to develop. Instruction: "You will all be writing down ideas on the same paper. When you're fully out of ideas, you rise your hands. When I come by, I will pick the idea I like the most so you can start creating it with the materials from the PMC-waste." When the children have gotten their approvals by the teacher, they get a form they need to fill in. They will write about the function of their object, how it works and for who it can be useful. They will also make a 2D-design of what they are about to make. Instruction: "When your form is filled in, one group member comes to show 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 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 is on it's 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. Suddenly a PMC-police officer walks in (in this case the teacher) and asks the children weather they have seen a stranger with a bag of PMC-waste. After that, the police asks if they have any PMC-waste in the classroom. He then caught his eye on an invention. He tells the children he would

		want to know more about them. And so he asks each and every group what they had made and what it was 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 evaluate children on different thing, depending on what you want to evaluate.*