Exploding Systems with Human Machines

Use this tool to deepen children's understanding of how complex systems can be influenced (after you have tried *Exploring Systems*).

◖ Step 1 ◗

"Human machines" invite children to use their bodies to collaboratively represent a system. Ask children to make a human machine that relates to a big idea, issue, or problem you are exploring together, e.g., *How can you create a human machine to show how...*

- *the dominant narratives of history are constructed and maintained?*
- *pollution causes problems in our city?*

- *our school might limit access to different groups?*
- *our class meetings flow?*

◖ Step 2 ◗

Support children's thinking by posing one or more of the following questions:

- *What are the different components of the big idea, issue, or problem?*
- *How does each part work with the others?*

- *If this were a machine, what would its parts be?*
- *What goes in and what comes out?*

◖ Step 3 ◗

Ask each group to share with one other group, discussing what each part represents and how it functions independently or interdependently.

◖ Step 4 ◗

Ask individual or pairs or children to draw a diagram showing how the machine works.

◖ Step 5 ◗

Ask children questions related to a big idea about the system:

- *How was your machine like another group's? How was it different?*
- *How did imagining the idea (problem, issue) as a machine help you understand it better?*
- *How did seeing other interpretations add to or subtract from your understandings?*
- *If someone wanted to strengthen (or weaken) this system, what would they do?*

◖ Step 6 ◗

Facilitate a group reflection:

- *What did you become aware of when you made the human machine that you weren't aware of before?*
- *How did that happen?*

Children benefit from opportunities to understand complex systems and imagine how they might be disrupted.

Children develop a sense of agency when they understand that the ways things work in our cultural, societal, and institutional systems are all inventions. Asking children to use their bodies to represent an abstract system at work, to diagram it, and to imagine how it can be changed supports their ability to conceptualize complex systems, and to imagine creative ways to redesign systems when problems arise. Experiences such as *Exploding Systems* deepen children's understanding of how to contribute to systemic change when a need is perceived.

Suggested Time Frame
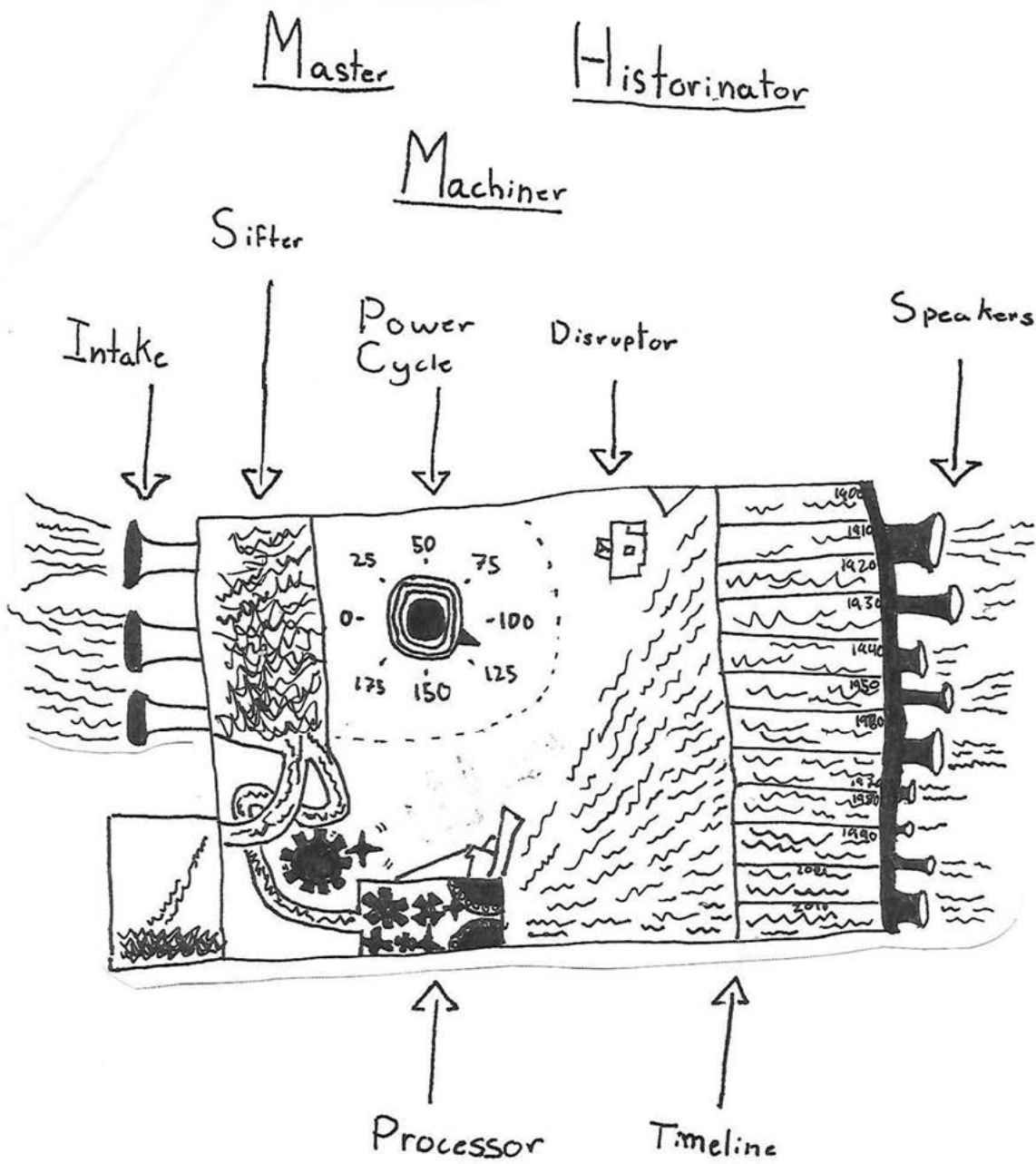
Approximately 45 minutes

When and How

Use this tool after facilitating *Exploring Systems* to deepen and extend children's thinking about complex systems and how they work.
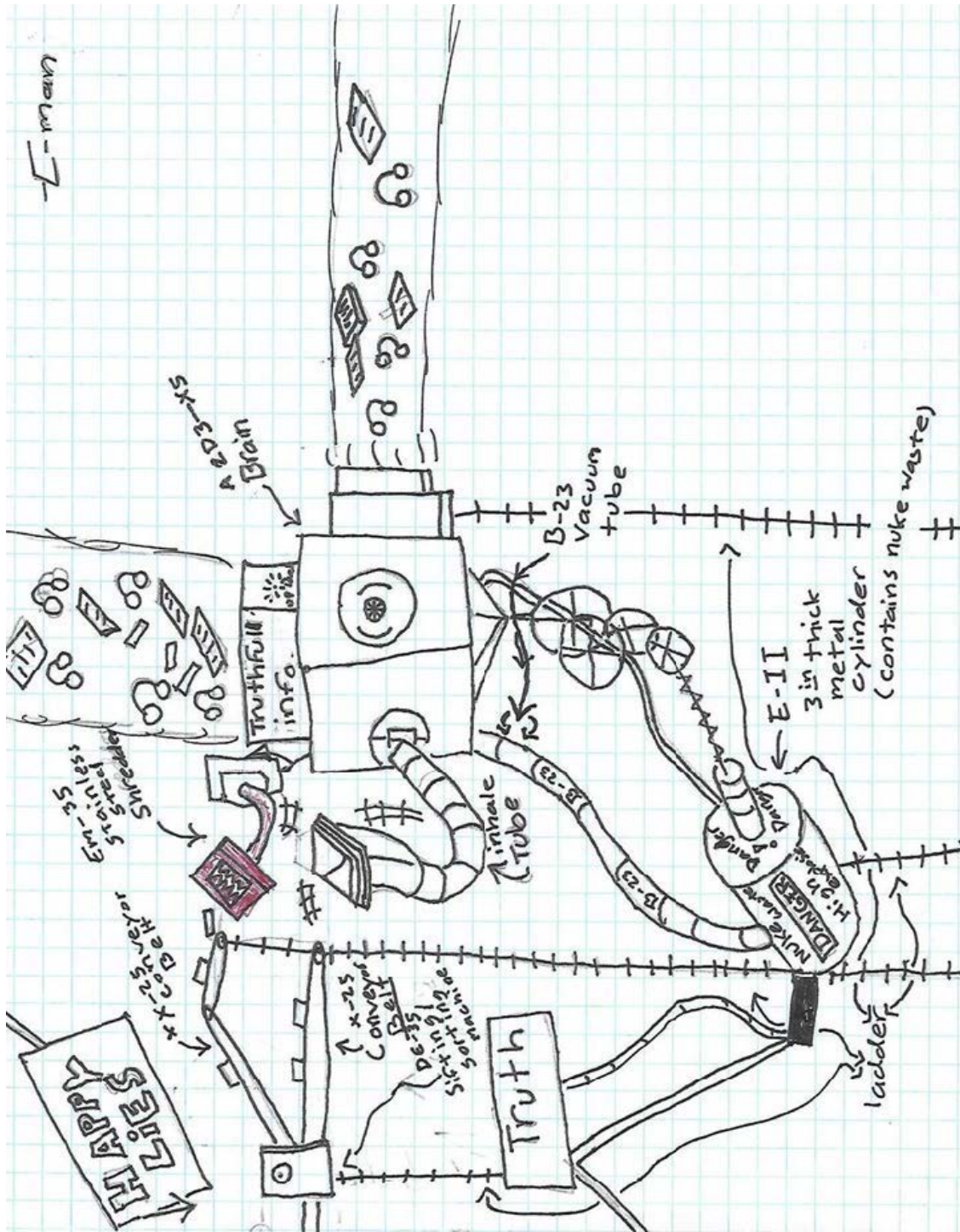
Tips and Variations

- Consider asking children to draw their machines using large blueprint paper, grid/dot paper, or choosing from a range of paper, pencils, and pens.
- Post photographs of the children's human machines and/or diagrams, along with the big question or issue, in the classroom so you can continue to build on the ideas represented (see examples from 4th and 5th graders on the next few pages).
- After children diagram their system, ask them to imagine a disruptor to the system and add it to their machine. Ask them to revise their blueprints to incorporate the disruption.

For video examples and reflections on practices that inspire inventiveness, become an Opal School Online Sustaining Member at *learning.opalschool.org*.

Master Historinator
Machiner

Sifter

Power
Cycle

Disruptor

Speakers

Intake

25   50   75

0-   -100

175   150   125

1900
1910
1920
1930
1940
1950
1980
1970
1930
1990
2000
2010

Processor

Timeline

Seba

Z-man

A ZD3-5X
Brain

Truthful info.

B-23
Vacuum
tube

E-II
3 in thick
metal
cylinder
(contains nuke waste)

Em-35
Stainless
Steel
Shredder

+X-25 conveyor
conveyor belt

Inhale
tube

B-23

B-23

Nukeduster
Danger

DANGER
Hi: Explosive

ladder

HAPPY
LIES

Ex-25
Conveyor
Belt

DE-35
sorting/
sorting
machine

Truth