

Can playgrounds generate electricity?

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2011-2012

Motivation

- Fossil fuels
- Pollution
- Resource scarce areas
- Demands of growing populations
- Can we make use of systems already in place?

TABLE I¹

POWER OUTPUTS OF COMMON HUMAN ACTIVITIES

<u>Activity</u>	<u>Maximum human power (W)</u>
Pushing button	0.64
Squeezing handle	12
Rotating crank	28
Riding bike	>100

Our Model

- Small scale model – concepts
- Magnetic fields
- Led light(s)
- What equipment can we manipulate?
- Children – fun?
- Safety – falls?



Merry-Go-Round²

Playgrounds

孳 Children have a lot of energy

孳 Learning process

孳 Small-scale electricity generation

孳 Fun way to generate electricity – offers an incentive

Questions & Concerns

1. Design?

2. **Safety?**

3. Energy generation?

Hypotheses

殯 Q1: *Can playgrounds be designed to generate electricity?*

殯 Q2: *Safety?*

殯 Q3: *How much energy can be generated from our models?*

Q1: Can playgrounds be designed to generate electricity?

H1.a: We can design and construct a small scale model to demonstrate that our equipment can generate electricity when used to power a light(s).

H1.b: We design and construct a model, yet it does not produce the amount of electricity desired, although it will still power a light.(it may take more energy from the user to keep the light powered. The design isn't as efficient as we had hoped for)

H1.null: We cannot design and construct safe playground equipment. (e.g. we can't make the equipment safe, it's not economically viable -- we're putting in more than we're getting out, etc)

Q2: Safety?

H1.a: Structures can be designed safely for child use

H1.b We may be able design some structures to be safer than others

H1.c Regardless of our designs, parent's safety concerns will limit the use of our energy generating structures.

H1.null: Our designs will prove not to be safe for child use.

Q3: How much energy can be generated from our models?

H1.a: Our small scale model will generate enough electricity to power small LED lights via manipulation of magnetic fields.

H1.b: Our model will generate enough electricity to power multiple LED lights.

H1.c: Our model will generate electricity, but not enough to power the installed lights.

H1.null: Insignificant amounts of electricity will be generated, if any at all.

How can we test our hypotheses?

• Calculate

• Model

• Data

• Analyze

• Compare

• How much power?

Expected outcomes

- Small scale energy generation
- LED lights
- Safe designs
- Model applications

Practical applications

- Schools
- Public parks
- Poor regions
- Developing nations
- Island nations



Wind Turbine³

Works currently in progress

Green Happenings at Bumbershoot this Weekend⁴



Energy Generating Playground: Aerial Merry-Go-Round⁵



Playground Concept Teaches Green Energy⁶



References

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