		PO	Method of Generating Movement						
			Exact	Difference	Moment	Positive	Circumstance		
Method of generating PO	Escape	• Learning/exploring without text	• Language independent • Kids' reading comprehension level is independent of their ability to learn about physics • More direct focus on experimentation and kinesthetic learning vs. learning via memorization (reading paragraphs)	• A lot of classroom learning leans heavily on absorbing paragraphs of text or reciting formulas that don't relay the scientific phenomena underlying it. Without any text-based learning, the experiments would be forced to be intuituve, effective and fun	• Interactive physics experiments will need to be extra engaging and intuitive to make up for the lack of any textual explanations • Possible integration of small tooltips or helpful blurbs that kids can click if they have questions or would like the option to read • Real-time visualizations of concepts that illustrate what is happening (air drag on a feather vs. bowling ball for example) -- with colorful or simple graphics	• Kids may start to drift away from the association that learning = school = not fun. Some kids may have a lot of fun with the physics experiments and have their interest piqued in studying physics in the future	• Some kids who think science is fun & reading is not won't be deterred by the reading • Engage with younger kids and/or kids with dyslexia, ADHD, or other disorders that can make it difficult to read a lot of text • ESL students won't be impeded by any language barrier		**Summary: Tailoring physics experiments to be language independent would facilitate a higher amount of students who would feel comfortably engaged with the concepts presented. Deciding for themselves which concepts to address would give students more autonomy over their learning and could benefit from the proposed "choose-your-own adventure" approach. Finally, engaging in an activity such as riding a bike or filling a balloon with helium would pique kids' interests before actually delving into the physics principles underlying the activity.**
	Reversal	• Kids decide the principles they will learn	• Kids get to choose to explore only those concepts that are interesting to them • No "forcing" kids to learn about springs if they would rather hear about gravity (for example)	• Often, instructors will place the same class material in front of 20-30 students and expect them to all be interested in learning the same thing at the same pace. A more independent approach would likely engage kids with the concepts if they have more autonomy over what they get to learn.	• Without provocation or guidance from an instructor dictating which exhibits to interact with, kids will need to take charge of their own learning. It goes without saying that learning should be made fun and accessible. • Concepts should be self-contained but also flow naturally from one exhibit to the next -- maybe one experiment touches on the speed of light and this prompts children to wander to the solar radiation exhibit • Choose-your-own adventure idea would work well	• Kids take charge of their own learning and can branch out independently from their peers • Instructors can spend more one-on-one time with students and worry less about keeping every student engaged	• Kids who aren't fond of traditional classroom environments but still have a healthy curiosity will benefit from having agency over their own learning • Reflects more closely the natural world and invites kids to explore the natural phenomena they find most interesting. Some people think springs are boring, but some people think playing with a slinky and figuring out how they work is awesome.		
	Distortion	• Kids replicate a physics phenomenon before thinking about the concept first	• Riding a bike, making a rainbow in a bottle, pushing a slinky down steps, yoyo-ing, sound reverb with music are all fun activities that have an opportunity to extract physics principles from them. If you ask kids whether they want to blow up balloon animals or learn about kinetic vs. potential energy, they'll probably pick the thing that sounds more "fun" (but they can do both!!)	• Difference is concerned with the focus on applications over theory. In reality these are entangled, but kids will engage more with learning when their curiosity has already been piqued about a fun activity	• Kids will need a "sandbox" where they can set up the thing they're learning about. Following an instructable for building a clock out of citric acid for example could get them invested before ever seeing any math or textbook explanations. Simulations could also be used as a substitute for a physical apparatus	• Kids are thrown into the action and are much more likely to quickly become engaged and stay engaged • Physics lessons will be more memorable ("Today I got to ride a bike and learned about x, y, and z" versus "Today I learned about x, y, and z")	• Encourages active learning by setting kids up to think outside traditional environments • Everyday/mundane activities could be a catalyst for asking further scientific questions		
	Exaggeration	• Every single force is perfectly simulated and real-world conditions are represented perfectly	• Closer to reality --> calculations would be more accurate and kids would get a better picture of what's going on • Challenges kids to think about a robust set of variables	• A lot of introductory physics demonstrations and experiments assume unrealistic conditions (like being inside a vacuum, ignoring the effects of surface area and air drag, etc.)	• Would need more time to explain the interactions between variables and introduce kids to the codependence of several forces • Kids would need a higher level understanding to avoid focusing on minute details or plug-and-chug equations • Higher math profiency probably required	• Kids would get a better sense of scale of interactions in the real world • Challenging kids with more complex systems could be beneficial	• Kids who have an accelerated interest in math or want to explore physics in a more realistic context would probably enjoy exposure to higher-order problems		
	Wishful	• What if physics was engaging for all students?	• The traditional medium of physics can be isolating for students who don't find themselves interested in science	• Students can find themselves zoning out or becoming indifferent during physics class and find themselves not engaging with the material	• Would need a variety of exhibits (some very hands-on, some more theoretical, some self-explanatory, some difficult to figure out) and a range of topics to choose from • Creative ideas for exhibits (building with legos, incorporating food and toys, computer games)	• Make it more engaging to increase the interest and retention rate in science classes in later years (high school and college)	• It would be beneficial to all students to have a wide array of experiments to engage with different learning styles, degrees of interests, ability and attention spans		