

Instructables website

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Www.instructables.com is a website that shows you how to make all sorts of weird and wonderful things, from apple coasters to a z-bend hyper-hornet.

With this exciting website, you can access most of the information without registration. For this review, we registered for free membership (you don't have to) and were sent a welcome message, followed by a personalised email from the 'Instructables Robot', which tells you that there are "tons of awesome things to see on Instructables", and offers a choice of browsing or a "guided tour".

The guided tour really helped; we did not really understand what the site was about until we worked through it. The 'home' page does not tell you enough, but the tour certainly does. Through this, we learned that Instructables is a web-based "documentation platform" where "passionate people share what they do and how they do it, as well as learn from, and collaborate with, others". This was still a little vague, and had we not been prompted by pictures of all sorts of gadgets, we might have wondered what we had wandered into. A link to the "awesome people" who make Instructables happen, reassuringly shows some fairly normal people, and, in the terminology of the site, the "seeds of Instructables germinated" at the Massachusetts Institute of Technology Media Lab in Boston, USA, with the site developing as a place for sharing projects and helping others.

Instructables are step-by-step descriptions of things that people have made, along with information about how they made them. As the site says, they are "educational, inspirational, and often replicable", and so they could be useful for enhancing and enriching science, technology, engineering and maths subjects, in and out of the classroom. The contents are divided into a number of sections, such as 'Health', 'Outside', 'Solar' and 'Technology'. The keyword-guided navigation leading to specific collections of instructables and information is not always intuitive, but it can be helpful.

Some of the instructables are clearly rather specialised, such as the dachshund wheelchair^{w1}, made to help an injured dog exercise during recovery, or fun-based, such as making a mermaid tail for swimming^{w2}. Many other ideas, however, are very educational, and certainly many look both exciting and feasible for students to try themselves, with suitable help as appropriate. This could be as a project or perhaps as extension and / or extracurricular activities, or even in cross-curricular groups. The longer you browse the site, the more you find. It seems to be a very active site, with new material being constantly added.

For the physics classroom, there is a large variety of gadgets to be built as teaching activities, such as a simple steam engine^{w3} or a Stirling engine built from a crisp package^{w4}, a Savonius wind turbine built from cardboard^{w5}, a fifteen-minute self-propelled hovercraft^{w6} or a solar-powered LED-lighted sun jar^{w7}.

More complicated projects include the breath-powered USB charger^{w8}, building a macro particle accelerator^{w9} that propels a conductive ping pong ball, or creating a lighted star map^{w10}. Or you may trick your students with the fake portable gravitation shield^{w11} – very useful for teaching magnetics.

Whereas many of the instructables from the 'Technology' and 'Solar' sections are most appropriate for use in the physics classroom, there are many interesting ideas for the other sciences, too: you could make luminescent silicone paint^{w12}, grow silver crystals^{w13} or build a ballistic soap bubble machine^{w14} in the chemistry classroom. In Earth sciences, building a tsunami model^{w15} with gutter segments could be fun; and in biology, you could grow oyster mushrooms in a coffee cup^{w16}, have the students build muscular anatomy models with Halloween skeletons^{w17}, bake or sew a cell model^{w18, w19}, or, if you want to get seriously involved, build your own thermocycler for PCR^{w20}.

The numbered steps for all the instructables, or projects, ought to make following the instructions easier, and the accompanying pictures look as though they should help a great deal. Some of the materials, e.g. "ultra-concentrated Dawn dish detergent (blue)", might be hard to come by outside the USA, but the great thing about this site is that you can ask about alternatives and are likely to get a response from either the project maker or others who contribute to feedback and discussions on the site. Suggestions for modifying projects

are common, giving a strong sense of user involvement.

Obviously, teachers thinking of using any of the ideas need to try them first and make sure that all the necessary materials are to hand. It is useful that approximate costs are given. Importantly to note is that the extent of the safety advice provided for each project is variable, so a thorough risk assessment would be necessary before letting students start.

If all goes well, and students want a further challenge, there is scope to design their own instructable, and a guide^{w21} is provided to help with this and to show how to upload it onto the site.

In addition to step-by-step instructions, the website offers photos and videos of the gadgets, informative articles on miscellaneous topics, contests amongst the users for uploading the best instructable on a given topic – such as the ‘Belt re-use challenge’ or the ‘Homemade soup contest’, and a very active discussion forum, including a question-and-answer section.

Note: There is an option of signing up and paying for ‘pro’ membership, for USD 1.95 / month, billed annually or USD 39.95 for two years as a one-time payment. A membership comparison list points out that signing up as a paid member would let you download PDFs, see instructions on a single page, view less advertising, and generally help to support the site. Members also receive the newsletter and gain access to past newsletter archives.

Web references

Below are the links to the individual instructables mentioned in the article.

The URLs are fairly self-explanatory:

- w1 – www.instructables.com/id/Dachshund-wheelchair
- w2 – www.instructables.com/id/How-to-Make-A-Mermaid-Tail-for-Swimming
- w3 – www.instructables.com/id/A-Simple-Steam-Engine-Anyone-Can-Build
- w4 – www.instructables.com/id/The-amazing-pringles-tube-Stirling-engine
- w5 – www.instructables.com/id/Cardboard-Savonius-turbine
- w6 – www.instructables.com/id/Fifteen-Minute%2c-Self-propelled-hovercraft
- w7 – www.instructables.com/id/Home-made-Sun-Jar
- w8 – www.instructables.com/id/Breath-powered-USB-charger
- w9 – www.instructables.com/id/How-to-make-a-macro-particle-accelerator
- w10 – www.instructables.com/id/Star-Map
- w11 – www.instructables.com/id/A-small-portable-gravitation-shield
- w12 – www.instructables.com/id/Making-Ooglo-Luminescent-Silicone-Paint
- w13 – www.instructables.com/id/Grow-Silver-Crystals-by-Electrochemistry
- w14 – www.instructables.com/id/Make-a-Ballistic-Bubbles-Machine
- w15 – www.instructables.com/id/Tsunami-Model
- w16 – www.instructables.com/id/Gourmet-mushrooms-in-an-old-coffee-cup
- w17 – www.instructables.com/id/Muscle-anatomy-with-Sugru-and-a-Halloween-skeleton
- w18 – www.instructables.com/id/Plant-Cell-Cake
- w19 – www.instructables.com/id/Plush-Cell-Model
- w20 – www.instructables.com/id/Coffee-Cup-PCR-Thermocycler-costing-under-350
- w21 – For instructions on how to create your own instructables, see: www.instructables.com/id/How-to-make-a-great-Instructable



To learn how to use this code, see: www.scienceinschool.org/help#QR