

KIT 10 - TIME MACHINE





DEAR LEGO® MASTER BUILDER ACADEMY MEMBER,

It's great to be back and communicating with you once more! It's been a long time since we last spoke in LEGO® MBA Kit 3. I hope that by following the tips and techniques of the LEGO Master Builders through each subsequent kit, you've continued to develop your skills as a builder. Now that you've learned to build strong models that tell great stories, you're finally ready to take the next step and move on to even more advanced techniques and challenges in Level 4 – Invention Designer!

Here in Kit 10, we're going to show you how to design mechanical models that look like they could really work, and we'll do it by introducing you to the wonderful retro-future world of Steampunk! Every day as a LEGO set designer, I'm confronted with the same kind of challenges that you are. How can I take a model concept and make it look like its technology comes from the past or the future...or even both at the same time? The solution lies in knowing how to imagine and build the right kind of mechanical details. By the time you finish this kit, you'll be well on your way to making your own amazing inventions, too.

NOW LET'S HEAD INSIDE AND SEE JUST WHAT KIND OF STEAM-POWERED MARVELS ARE WAITING WITHIN!

Mark Stafford,
LEGO Designer





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WELCOME TO LEVEL 4!

GET READY TO GET INVENTIVE!

We're glad you could join us for the latest stage in your journey to become an expert LEGO® builder! In **LEVEL 4 - INVENTION DESIGNER**, you'll combine your creative imagination with the advanced building skills you've learned as a member of the LEGO Master Builder Academy to make fun, challenging and even functional inventions, inspired by real and imagined innovations from all throughout history!

It all starts right here in LEGO MBA Kit 10, where you'll launch your Invention Designer adventure by building a vision of tomorrow as it could have been seen by the inventors of yesterday. For the models in this kit, the LEGO Master Builders have merged the futuristic idea of time travel with the clockwork gears and puffing steam engines of the Victorian 1800s – a fantastic form of science fiction known as **STEAMPUNK!**

In the pages of this handbook, you'll use the new LEGO Master Builder technique of **MACHINERY** to incorporate mechanical details into your invention models, and the **MATERIALS** technique to pick out the right LEGO elements to give your creations the look of wood, iron, paint and steel. You'll get plenty of practice with both as you build a set of all-new springboard models and the first of the three Level 4 star models: a steam-powered sci-fi **TIME MACHINE** that will let you take your imagination anywhere and any-when you want it to go.

And that's just the beginning! In your next kit, you'll encounter one of the greatest inventions of all: architecture from all around the world. You'll find out how the designers of real buildings make their creations sturdy, good-looking and strong, and how different cultures and civilizations have invented their own unique styles of building.



Finally, you'll explore the secrets of the Inventor's Lab and discover how one of history's greatest visionaries created machines that were far beyond their time!

So strap on your Invent-o-Pack, sketch up some steam-powered springboard models, and get ready to take an imaginative voyage through time. You're sure to be an even better LEGO builder when you come out on the other side!





CONTINUE THE ADVENTURE ON **LEGOmba.com!**

Your Invention Designer journey continues on the LEGO® MBA website!

The LEGO Master Builder Academy is much more than just the kits and designer handbooks. Check out LEGOmba.com for the full online experience, including all-new videos, quizzes, skill tests, springboard model building instructions, and bonus tips from the real LEGO Master Builders. Earn badges, get feedback on your creations, and share your building knowledge with your fellow LEGO MBA members!



To join the online journey, visit LEGOmba.com and use the exclusive code below to register your LEGO Master Builder Academy Level 4 membership. Once you've created or updated your account, click on Member Access and select Kit 10 from the book-box at the top right of your LEGO MBA design desk for full access to all Kit 10 articles and activities!

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THIS CODE UNLOCKS LEGO®
MBA KITS 10, 11 AND 12

TIME TRAVEL

AS THE TIME-STREAM WHIRLED AROUND HIM, HE CLUNG TO HIS SEAT AND WONDERED EXACTLY HOW HE'D GOTTEN INTO THIS MESS.

It had started with the ultimate challenge for any inventor: a real time machine! Of course, it had looked a little odd at first. What kind of time machine is powered by a puffing, smoking steam engine? And now he was hurtling out of control through a chaotic storm of instants and centuries, the engine chugging away as the pilot capsule spun dizzily around and around. If he'd eaten lunch before he left, he was pretty sure he'd have lost it by now.

He pushed frantically at the time machine's many buttons and levers. He must have hit something right, because the swirling began to slow and he found himself able to make out individual moments in the storm: huge reptiles, tall stone pyramids, figures riding horses, silvery rocket-ships, and...what were those unfamiliar and interesting-looking machines?

It looked like he'd found his next destination. With his confidence building as he gained practice with the controls, he guided the still-spinning time machine toward that window into a strange new world.



IMAGINE HAVING THE ABILITY TO VISIT ANY PERIOD OF TIME THAT HAS EVER EXISTED - PAST, PRESENT OR FUTURE.

For centuries, this fantastic and impossible idea has tantalized writers, philosophers, and other creative thinkers and dreamers. With **TIME TRAVEL**, the possibilities for discovery and adventure are endless.

By traveling back in time, you could witness key people, places and events from history. You could visit Feudal Japan, tour the Roman Colosseum, and even drop in on the 1960s. You could be an observer, become a participant, or maybe even change the course of history to reshape the world of the present day.

Or you could travel forwards into the future! No one knows exactly what tomorrow holds. Will you discover a galaxy full of space-flight and bold intergalactic progress, or a strange new world of unknown species and alien civilizations? You might even discover that the future is a whole lot like today...but where's the fun in that?

No matter where or when you're planning to go on your travels through time, you'll need a way to get there and back again. That's where a **TIME MACHINE** comes in handy! The famed science fiction author H.G. Wells popularized the idea of a device that can be controlled to travel through time in his 1895 novel, *The Time Machine*. In the book, a scientist makes a journey to the distant future to observe the fates of humanity and the Earth, and returns home to report on his discoveries. Since then, many other writers have used the concept of a time machine to tell their own stories through literature, television and film.

It may not exist in reality, but a time machine is still a type of invention. As a creative designer and story-teller, you can invent things with your mind just as well as you can make them with your hands. It's an important lesson to remember throughout your **Invention Designer** journey: whatever you can think up, no matter how fantastic and impossible it might seem, you can always build it with your LEGO® bricks and your imagination. Who knows – maybe one day what you've learned from creating made-up inventions will help you build your own real working time machine!

IT'S TIME TO EMBRACE THE ENDLESS POSSIBILITIES OF TIME TRAVEL.

WHEN DO YOU WANT TO GO TODAY?



FEUDAL JAPAN



ROMAN COLLOSSEUM



WILD WEST



Steampunk

THE TIME MACHINE CAME DOWN WITH A BONE-JARRING THUMP, ITS LONG WINGS FOLDING UP AS ITS PROPELLERS SLOWLY STOPPED ROTATING. HE WAS DEFINITELY GOING TO HAVE TO PRACTICE HIS LANDINGS.

Peeking out from behind the building where he'd tried to quietly set down, he marveled at what he had discovered. Based on the construction materials of the buildings and the fashions of the citizens, it looked like Victorian England... but the 19th century had never had machinery like this!

Everywhere he looked, he saw inventions. They clanked down the streets, whizzed and whirred between buildings, and even floated through the sky. They were bright, colorful and noisy, assembled from old-time materials like polished wood, shiny brass and geared clockwork, and almost every one of them was powered by a steam engine, just like his time machine.

That gave him an idea. His Invent-o-Pack wouldn't work without a stored charge of creative energy, but maybe he could substitute something more appropriate to this place. Taking the pack apart, he borrowed a few spare pieces from the time machine and rebuilt it in a style that matched his new surroundings. It looked both lower and higher-tech now – an Invent-o-Pack version Zero, perhaps. He also rigged together a hand-held Universal Invention Controller device, which he had a feeling would come in handy here.

There was just one last thing that he needed. Rummaging around in the pilot capsule, he retrieved a fine gentleman's top hat. With the hat on his head, the controller in his hand, and his new Invent-o-Pack v.0 chugging with its own miniature steam engine on his back, he was ready to explore this time of new adventures – and new inventions!



STEAMPUNK imagines a setting in which the Industrial Revolution came early, creating an alternate-history world that revolves around clockwork, gears and steam engines. It's a fantasy-filled style of science fiction that involves the materials of the past – like wood, brass, iron and leather – being used for the invention of machinery that never really existed at that time, from boiler-powered automobiles to flying machines that run on burning coal.

A common theme of many steampunk inventions is that they are powered by a steam engine, in which a metal boiler heats water into steam, building up pressure to make connected parts like pistons and turbines move. Steampunk designs tend to look very intricate and mechanical. They're often covered with gears and have tall smokestacks that blow out clouds of hot, white steam. Other steampunk devices might be wound up like a pocket watch or pedaled like a bicycle.

Steampunk can extend from major modes of transportation to the simplest parts of life. In fact, a lot of the inventions in steampunk fiction look like objects you've seen in history books, only taken to the next level. Even its trains and hot-air balloons look familiar...just much more complicated!

One of the most popular settings for steampunk is the Victorian era of England during the 1837-1901 reign of Queen Victoria, a time when newly-developed steamboats and railways were starting to open up the world to travel and exploration. Another favorite setting is the Wild West.



A common theme for both is the presence of trains, which is no surprise, since the steam-driven engines and clanking gears of old-time locomotives are a big influence on steampunk designs.

Steampunk inventions are usually more advanced than the historical technology of their setting, but they're always designed to fit that time's fashion and culture. A good way to start thinking up steampunk creations is to look at a real invention that's around today and then imagine how the people of the past would have built it using the knowledge and tools that were available to them back then. You can even think about how past inventors might have envisioned vehicles or gadgets that are still futuristic to us today, like spaceships and jet packs.

There aren't many restrictions when it comes to designing a steampunk model. You need to know about the time period in which your creation is based, so that you know what kinds of styling and details will make your model look like it was made with the materials of that time. It also needs to look like it's powered by a believable technology (even if that technology isn't real), with a mechanical appearance. Building a model with the right combination of machinery and materials might sound tough, but fortunately, those are the techniques that you'll be learning about in this very kit!

STEAMPUNK OPENS UP A WHOLE NEW WORLD OF LEGO® MODEL DESIGN. LET'S START INVENTING!

LEGO® MBA Technique:

Machinery

CREATE THE LOOK OF TECHNOLOGY AND MOVING PARTS!

It's one thing to build a custom model and call it an invention. But can you make it really look like one? It's easy once you know how – thanks to the advanced LEGO® Master Builder technique of **MACHINERY!**

Building machinery is a special use of the **DETAILS** technique. It involves adding pieces to your creations that give them the look of fully-functioning machines. They don't have to actually move and work (that's a technique that you'll be practicing in Kit 12!), and it doesn't matter whether they're real-world devices or science-fiction technology. They just have to look like they could turn on and do something interesting.

The classic **SIDWAYS BUILDING** technique will help you out a lot when you're working with machinery details. Incorporating pieces with holes or studs on their sides into your models will let you attach all sorts of useful technological parts onto them.

USE SIDWAYS BUILDING
TO ADD MACHINERY DETAILS!



HERE ARE A FEW OF THE LEGO® MASTER BUILDERS' FAVORITE PIECES FOR BUILDING MACHINERY, SOME FROM THIS KIT, AND OTHERS THAT YOU MIGHT BE ABLE TO FIND IN YOUR LEGO BRICK COLLECTION.

READOUTS AND DISPLAYS

Give your inventions a way to tell their users how well they're working by adding dials, gauges, lights and computer readouts to their surfaces. Special printed or stickered pieces and clear or transparent colored elements work great for either industrial or hi-tech displays – just pick the pieces that fit your invention's level of tech!

INTERACTIVE CONTROLS

You'll also want to provide a way for your characters to interact with and control the machines you build. Levers, wheels and handles are all details that make a mechanical device look like somebody's in charge of making it work. Try attaching them with **LEGO® TECHNIC ELEMENTS** so they can really move. You can use **SMALL ELEMENTS** to create buttons, too!



MACHINE COMPONENTS

Use the Machinery technique to build more complex components into your inventions, too. Look at pictures of real machines and think about what makes them look like they really work and function: engines, gears, turbines and other mechanical parts that move or generate power!



EXTRA DETAILS

You can use the previous tips to make a machine that looks like it has a function... but what about one that looks really cool while it's doing it? Add extra details to your invention to give it its own **STYLING**, whether you're going for sleek and futuristic, rugged and industrial, or complex and delicate. The right details help to define the setting for your machine – like whether it comes from a steampunk world!

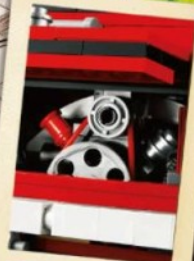
SPECIAL EFFECTS

Want to add some extra oomph to your invention? Make it look like it's already working and doing something by adding some special effects. You could build puffing smoke coming out of a chimney, a firing laser beam, a clear energy field, a jet of glowing fire, or anything else you can imagine your machine producing!



PUT IT ALL TOGETHER!

Once you've worked out all of the components of your invention, it's time to put them together and make an awesome-looking machine creation!



LEGO® MBA Technique:

Materials

DESIGN MODELS THAT LOOK LIKE THEY'RE
MADE OF WOOD, METAL AND MORE!

A big part of designing advanced LEGO® models is making your creations look believable. When building an invention or any other kind of assembled or manufactured object, you can improve its appearance the LEGO Master Builder way by using elements that mimic real **MATERIALS!**

The Materials technique takes what you've already learned from practicing the **COLOR** and **STYLING** techniques and gives it a special new spin. Now it's not just about making models look good – it's about using your LEGO bricks to replicate the colors and styling of specific materials so that your models can tell their stories even better.

Think about the colors, shapes and textures of the materials that objects are built out of, like metal, wood and glass. What do those materials look like, and what pieces in your collection can you use to match them?



WOOD

To make an object look like it's made out of wood, use natural shades of brown and create long, smooth shapes. Wooden beams can be either flat or rounded, but are seldom square. Stacked palisade bricks imitate vertical log walls, and long tiles or plates look like wooden planks.

METAL

Metal can be crafted into just about any form you want, so the shape of your element doesn't matter as long as it has the right color and texture. Keep your surfaces smooth, and use black pieces for industrial iron, gray or silver for steel, and gold for steampunk-style brass, bronze or...well, gold!



STONE

You've already practiced building objects that look like they're made of stone with Kit 8's Forbidden Bridge, so you know that the best way to do it is with shades of gray and surfaces that are flat with the occasional grooved or rounded brick for texture. When building a rock wall, stagger your bricks so they look like individual stones that have been stacked on top of each other. You can also use tan or yellow elements for sandstone blocks.

BRICK

Bricks make it look like someone worked hard to build an object to be strong and durable. Stagger red or tan LEGO bricks of the same size and shape to build a brick wall. There are also elements with brick patterns already sculpted into them. Sloped elements often have a rough texture that makes them perfect for brick roofs.

PAINTED SURFACES

If you want a touch of extra color on your creation, then you can build it to look as if some of its wood or metal has been painted. Use the same techniques as above, but with elements in different colors!

GLASS

Building an object to look like it's made of glass is easy – just use clear elements! There are already LEGO pieces designed to look like glass windows and doors, and others that make great bulbs or headlights. You can also use colored transparent pieces for tinted glass or clear objects with liquids or energy inside.



PUT IT ALL TOGETHER!

Now that you know how to build different materials, try combining them in a single model to make a realistic-looking invention – or anything else made out of wood, glass, metal and other components!



VISIT YOUR **KIT TO DESK** AT LEGOmba.com TO FIND OUT MORE ABOUT USING THESE TECHNIQUES!

INVENTOR BUILD

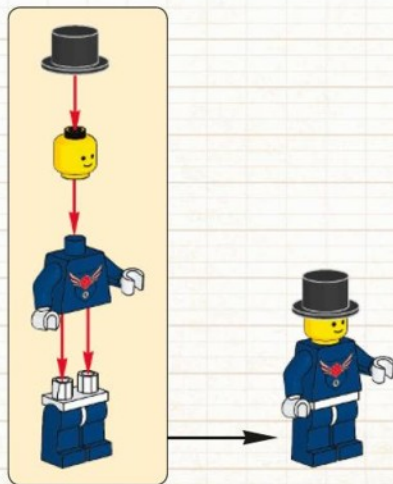
GEAR FOR STEAMPUNK INVENTIONS!

The LEGO® MBA Minifigure has just started a whole new adventure in the world of inventions and time travel – but he needs your help to get prepared!

Build your Level 4 Minifigure and gear him up to explore the retro-historical science fiction universe of steampunk! Start by giving him a dapper top hat so he blends in with classic Victorian fashion. Next, assemble the all-new Invent-o-Pack v.0, perfect for building steam-powered creations. Finally, build a hand-held Universal Invention Controller so he can remotely control his Time Machine and other inventions!

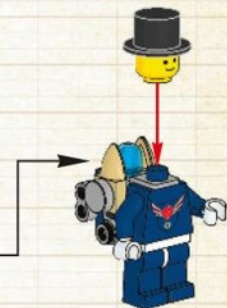
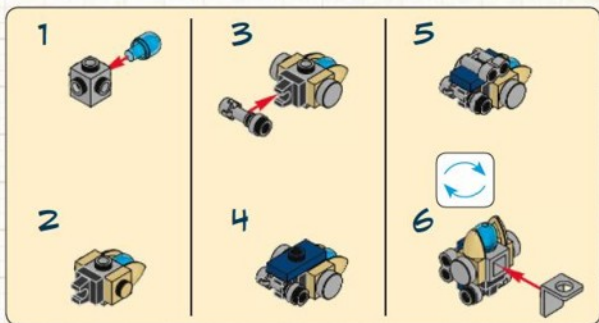


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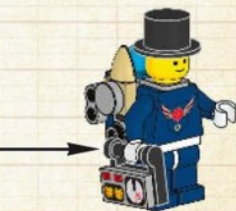




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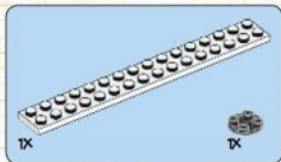




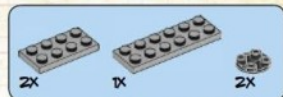
TIME MACHINE

Start your journey into invention design with the ultimate technological achievement: the Time Machine! Designed in the distinctive steampunk style, the Kit 10 star model is covered with Machinery and Materials details, from the metallic temporal propellers on its folding wings to the black iron boilers and smokestack in back.

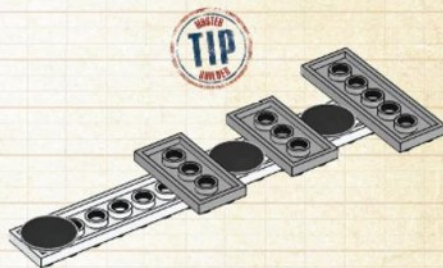
Once you've assembled the Time Machine, take it for a spin through the time-stream with the help of the functional gearing mechanism built into its rotating pilot capsule. Pick any destination in time and space...and hold on tight for your next invention adventure!



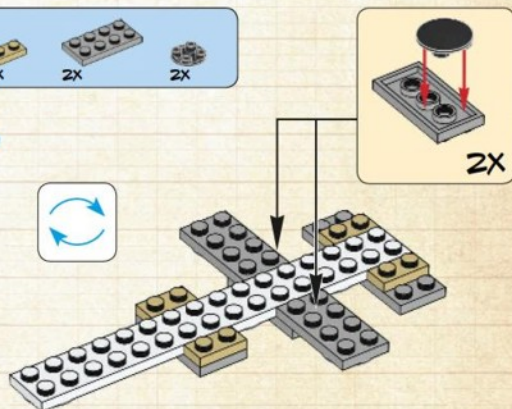
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STEP 1 TIP: BUILD A SMOOTH RIDE

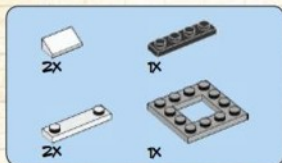
Smooth pieces beneath a model let it glide without catching on surfaces. That's why you'll often find round sliding plates like this one under LEGO® boats. It will help your Time Machine slip effortlessly through the time-space barrier!



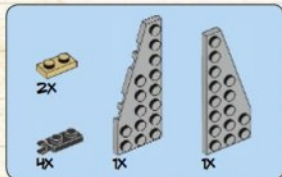
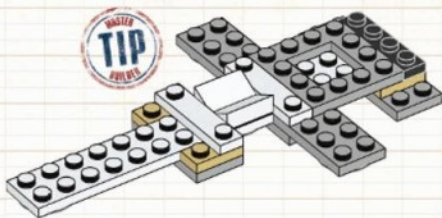
STEP 2 TIP: STABLE TRAVELS

You also want your invention to have as much **BALANCE** and **STABILITY** as possible, so add some plates to make it rest evenly on a flat plane. By making the last one longer, you're starting to build a foundation for the wedge-like **SHAPE** of the Time Machine.

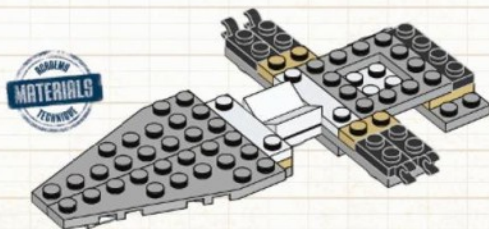




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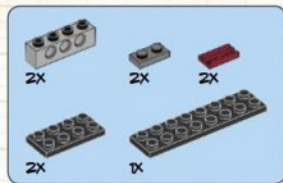
**STEP 4 TIP: SLOPES FOR THE FUTURE**

Your Time Machine will have a working mechanism, so make sure you plan ahead. These two slopes will create a groove to support the gearing for your time-travel function later on.

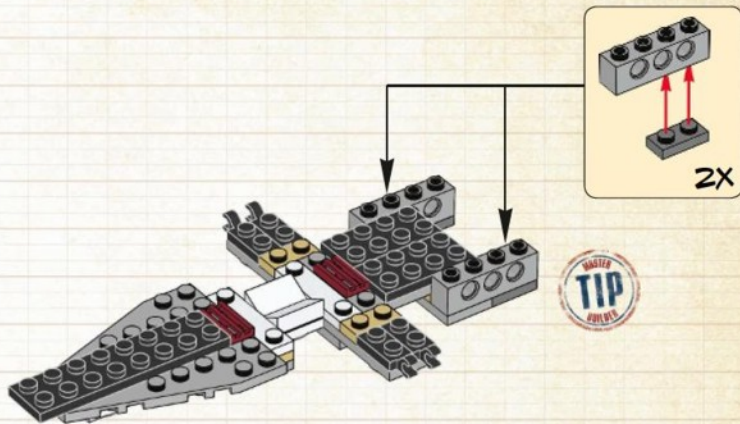
HERE'S THE LEGO® MASTER BUILDER TECHNIQUE OF MATERIALS!

By picking your elements carefully and considering their color and texture, you can create models that look like they're made of metal, wood, and other recognizable materials. Your minifigure inventor likes to recycle, so use these wing-shaped gray plates to create a metallic aluminum base.

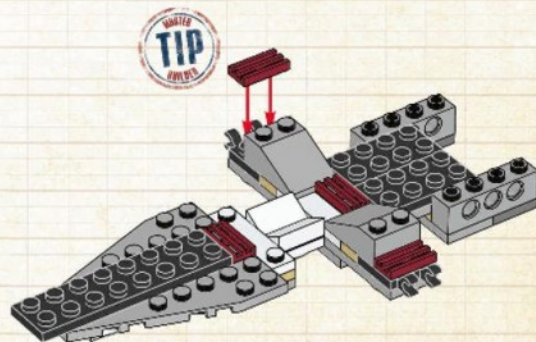




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STEP 6 TIP: EXPAND THE ADVENTURE

Do these LEGO® Technic bricks look familiar? That's right – the Time Machine is compatible with the **MODULAR BUILDING** system of the Level 3 adventure models. Connect it to your other creations to make entire time travel scenes!



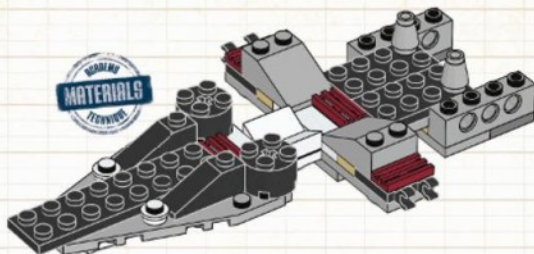
STEP 7 TIP: FLIGHT FOUNDATION

Continue the **STYLING** you've started by adding additional grilles as sci-fi accent **DETAILS**. These sloped bricks will **LOCK** the foundation for your Time Machine's angled wings.

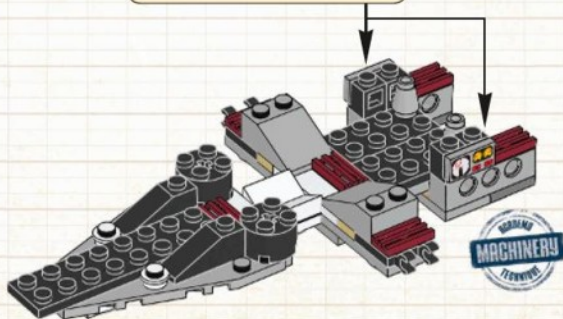
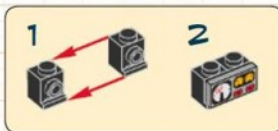




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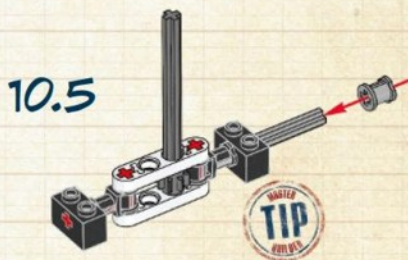
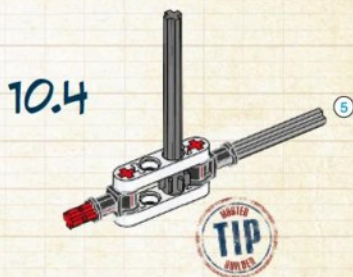
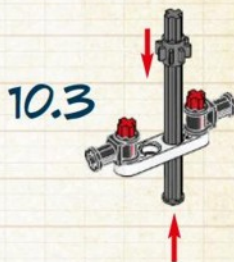
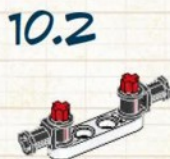
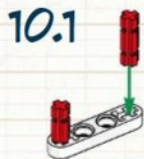
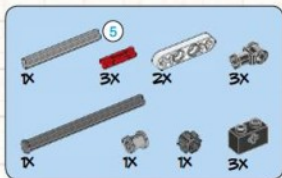
STEP 8 TECHNIQUE: MATERIALS!

An invention's metal components can take almost any shape. Black round bricks and slopes will make it look like these parts are made of iron, and their smooth faces mimic the texture of metal – plus, they'll provide a good sliding surface for your invention's key.

HERE'S THE LEGO® MASTER BUILDER TECHNIQUE OF MACHINERY!

Technological inventions should look like they can turn on and do something. Use *SIDWAYS BUILDING* to attach some printed tiles as pressure gauges and readouts to help your Minifigure monitor the Time Machine's systems.





STEP 10.4 TIP: BUILD IN SOME SPIN

Time to use **LEGO® TECHNIC ELEMENTS** to build a working mechanism! This geared module is the source of your Time Machine's spinning pilot capsule function. By sandwiching the Technic gear between two half-beams, you lock it down while still allowing it to rotate.



STEP 10.5 TIP: LOCK TWO WORLDS TOGETHER

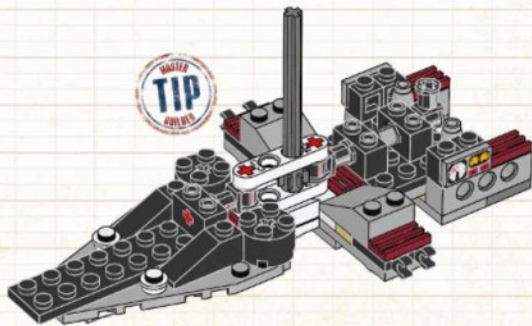
To securely **LOCK** a Technic module into a model made of standard LEGO bricks, use pieces that can connect to both. These 1x2 bricks with Technic cross-axle holes will hold your spinning mechanism steady so that all of the parts line up just right.



10.6



10

**STEP 10.6 TIP: CHANGING DIRECTIONS**

A tall chimney or smokestack gives an invention a great steampunk look, but you need to make sure it's stable from the base up. Because of the way they connect, Technic pieces make for super-strong models, so add this catch with cross-hole!

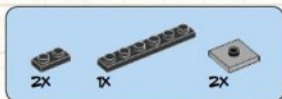
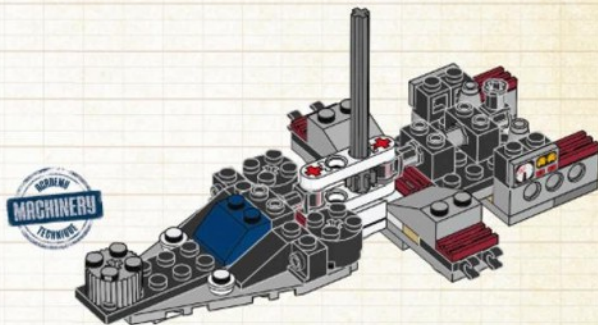
STEP 10 TIP: SLOPES FOR THE PRESENT

Remember that sloped groove you added back in **STEP 4**? It forms a perfect cradle for your Technic module. Creating sections that fit together this well is why the LEGO® Master Builders do so much building and rebuilding when they design new models.

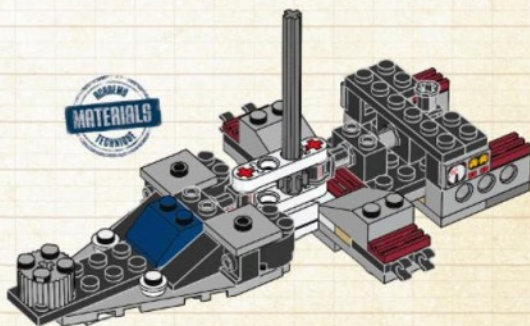




11



12



STEP 11 TECHNIQUE: MACHINERY!

For some extra mechanical detail at the front of your Time Machine, attach a grooved round brick. Not only will it help support the time bumper that you'll be adding shortly, but its texture makes it look like a big metal gear – a perfect touch for steampunk creations!

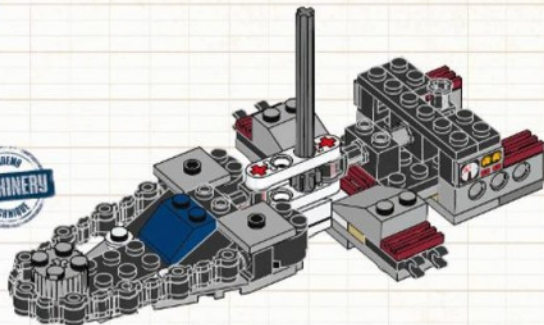
STEP 12 TECHNIQUE: MATERIALS!

LOCK your invention's iron components down with a pair of 2x2 jumper plates. With their smooth gray finish, they'll look like steel plates that have been bolted onto the Time Machine for extra strength.



1x

13



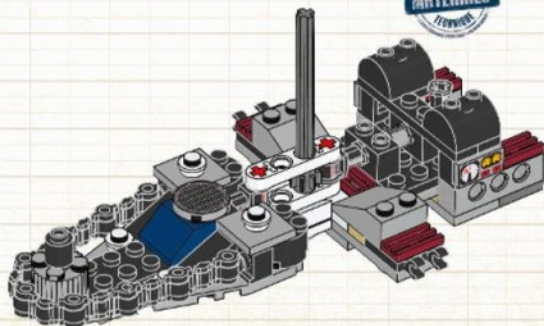
2x

1x

2x

1x

14

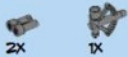
**STEP 13 TECHNIQUE: MACHINERY!**

Protect your Time Machine from accidents with a bumper around its front end. In combination with the grooved round brick, it looks like a linked tread operated by a gear. Always time travel safely – if you crash into history, you could change everything!

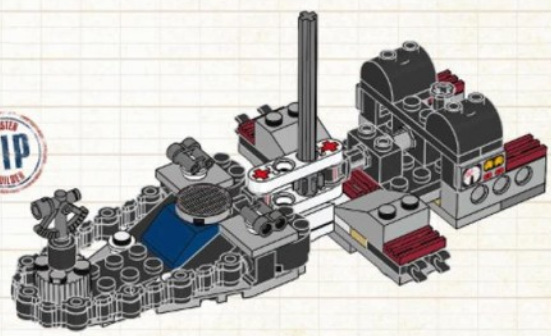
STEP 14 TECHNIQUE: MATERIALS!

Time travel takes a lot of power, especially when your technology is based on steam. To give your invention enough to get there and back, build a pair of good old-fashioned boilers in black iron so they're strong enough to hold up to all that heat and pressure. A printed round tile adds an extra bit of **MACHINERY**.



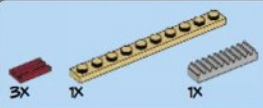


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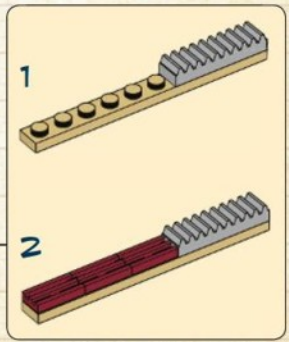
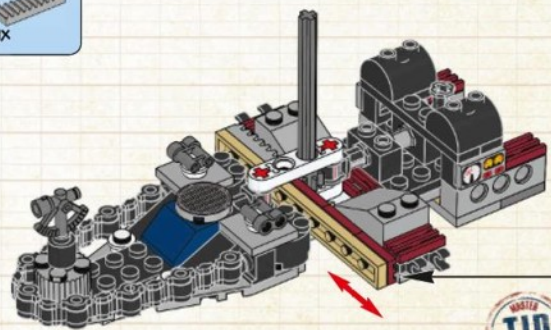


ACCESSORIZING

Want to make an invention that appears to be cobbled together out of spare parts? Add pieces with clips or holes that can hold minifigure accessories. There's nothing like random small components to make an invention look like it does something interesting, even if it's you're not quite sure what that something is.



16



STEP 15 TIP: IMAGINE THE JOURNEY

To create an invention that looks like it's ready to explore time and space, give it **STORY BUILDING** navigation details like a sailor's sextant in front. Those binoculars seem like they're there to do something important, too. That's what makes them such good **MACHINERY** elements!



STEP 16 TIP: THE KEY TO ADVENTURE

What's this odd little gizmo? It's the key to starting up your Time Machine! The ridged plates on the key will interact with the Technic gear to make the axle – and anything it's attached to – spin when you slide it back and forth or pull it out quickly.



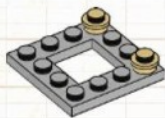


2X



1X

17.1



2X



1X

17.2



1X



1X

17.3



1X

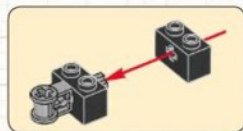


2X



2X

17.4

**STEP 17.2 TECHNIQUE: MACHINERY!**

A pair of movable joystick-like elements will give your Minifigure a way to control the Time Machine from inside the pilot capsule. The plate with holes lets the spinning axle go all the way through the capsule while providing a needed building surface.

STEP 17.4 TIP: BUILD IN SPIN

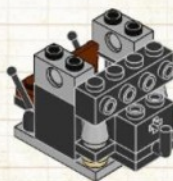
This Technic catch piece will lock the capsule onto the axle so that they rotate together. If you want to know more about LEGO® Technic elements and their names and functions, check out the article in your Kit 6 To-Do List on the LEGO MBA website!



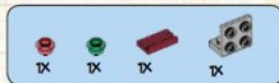
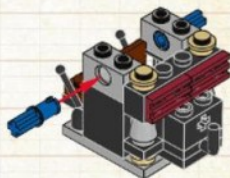
17.5



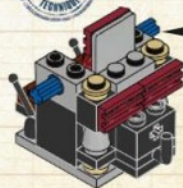
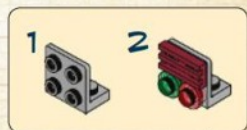
17.6



17.7



17.8



STEP 17.5 TECHNIQUE: MATERIALS!

The spinning capsule means that your inventor is in for a wild ride, so make sure he travels in style and comfort. This minifigure seat in brown looks like a leather-covered chair for a solid steampunk *DETAIL*.

STEP 17.8 TECHNIQUE: MACHINERY!

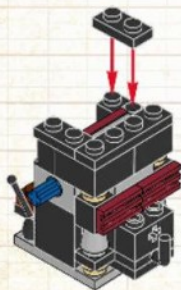
Transparent 1x1 round plates make great status lights for the interior of the pilot capsule. When the green light is on, all systems are working fine...but when it's red, look out!



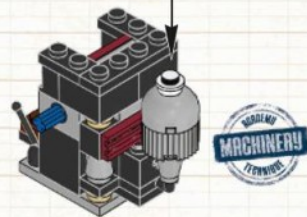
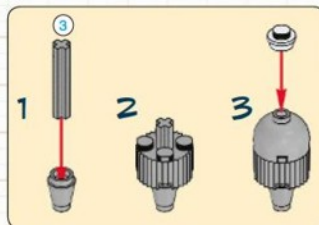
17.9



17.10



17.11



1:1

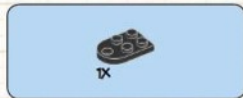
STEP 17.9 TIP: MACHINERY MOUNTS

A pair of Erling bricks will make the perfect mounting points for hi-tech additions later in your build!

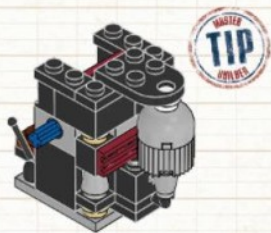
STEP 17.11 TECHNIQUE: MACHINERY!

By combining different interestingly-shaped elements, you can create a detailed mechanical component for the Time Machine's capsule, such as an air tank or another useful part for trips through time. Using gray bricks gives it the look of strong metal MATERIALS like aluminum or steel.

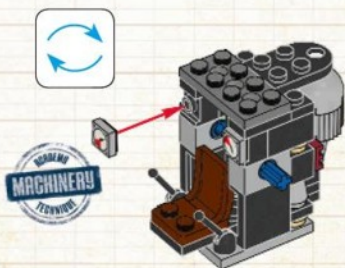




17.12



17.13

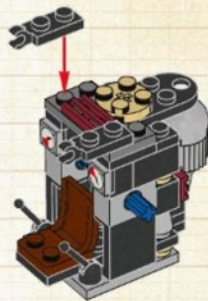


STEP 17.12 TIP: CONSISTENT STYLE

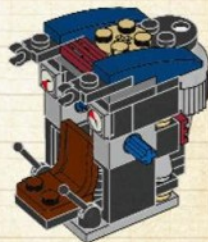
You need a piece that will **LOCK** down your new component (after all, you don't want it breaking loose during trips through time!). This curved plate will do the job while matching the steampunk **STYLING** of the rest of the model.



17.14

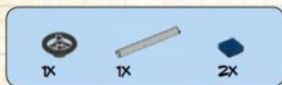


17.15



STEP 17.13 TECHNIQUE: MACHINERY!

To let your inventor monitor the Time Machine's systems from his control chair, add on some additional machinery details with **SIDWAYS BUILDING**. These printed tiles will serve as clocks: one to display his home time zone, and one to show him where – and when – he's going.

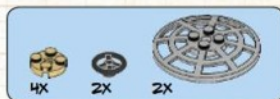


17.16

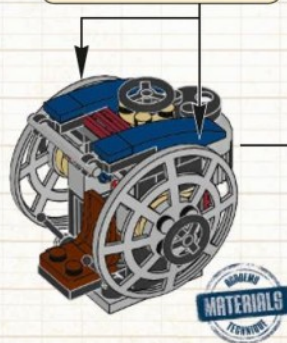
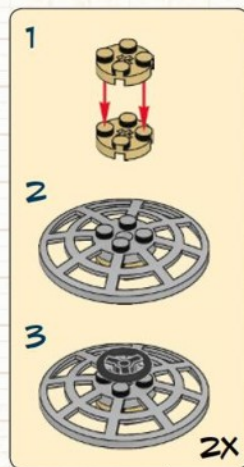


STEP 17.16 TECHNIQUE: MACHINERY!

The location of a machinery detail changes its function and story. On a race car, this valve wheel might be for steering, but on your Time Machine, it's used to access important mechanical systems for emergency repairs!



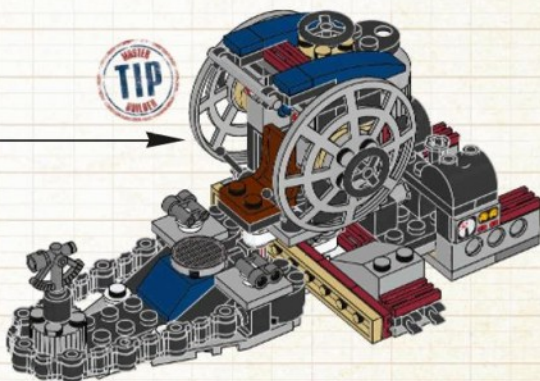
17.17



STEP 17.17 TECHNIQUE: MATERIALS!

Protect your pilot during dangerous time journeys with a set of titanium-gray radar dishes on the sides of the capsule to absorb and disperse choral vibrations. Valve wheels transform these into MACHINERY details, too.

17



SPECIAL FEATURES

A spinning pilot capsule is just one kind of feature that you can build into your model inventions.

With different special elements, you can make them move or roll, give them spring-loaded LEGO® Technic functions like the ones you practiced building in Kit 6, or even add lights and sound to your creations!



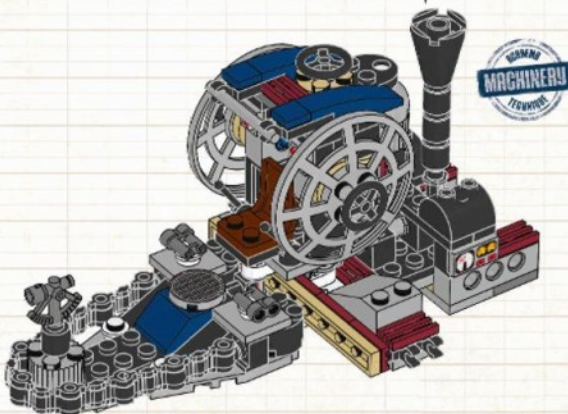
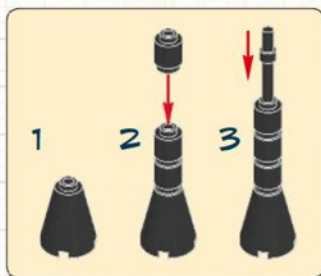
STEP 17 TIP: A TURN FOR THE BETTER

Now that the pilot capsule is complete, push it down onto the base section's upright cross-axle. Test out the function of the key and make sure the capsule spins smoothly. If it doesn't, double-check your connections!



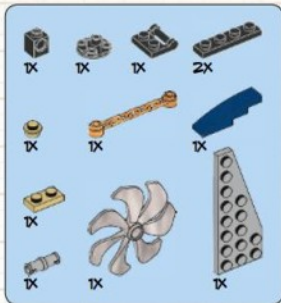


18

**STEP 18 TECHNIQUE: MACHINERY!**

By flipping over a cone and stacking up some 1x1 round bricks (all in black for the MATERIALS appearance of tough iron tubes), you can give your Time Machine a chimney for venting excess steam from the boilers in back. A long rod through the center of the bricks will make the smokestack stronger and easier to attach. This is a component that will really make the model look like a steampunk design.





19.1



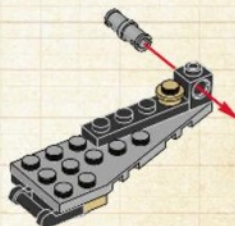
19.2



19.3



19.4



STEP 19.2 TIP: UNDER-STYLING

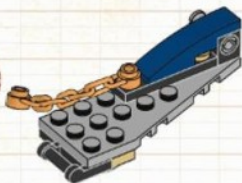
This Time Machine doesn't just sit on the ground while it travels through the centuries – it takes off into the air, too. A key difference between a flying model and ground-based ones is that people can see underneath it, so match the **STYLING** of what you've built so far with another round sliding plate to **LOCK** this wing connector together.



STEP 19.3 TECHNIQUE: MATERIALS!

By adding a black iron plate to your gray metal wing, you build a structure that looks like it was patched together from different materials for maximum strength when flying through temporal storms.

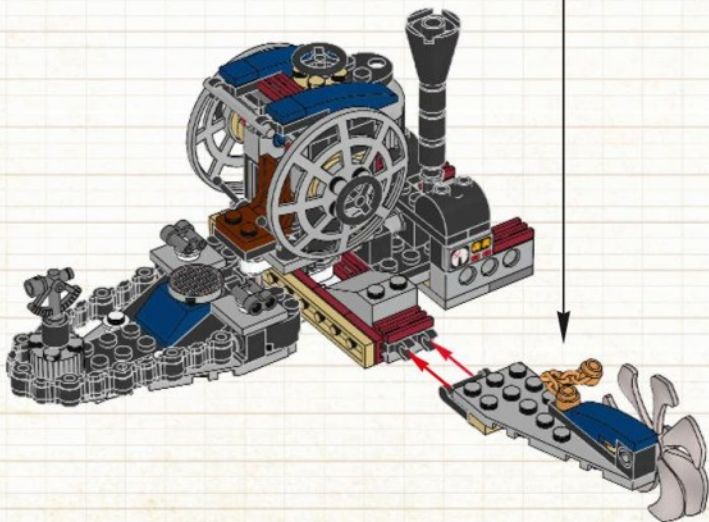
19.5



19.6



19

**STEP 19.5 TIP: REFINED DETAILS**

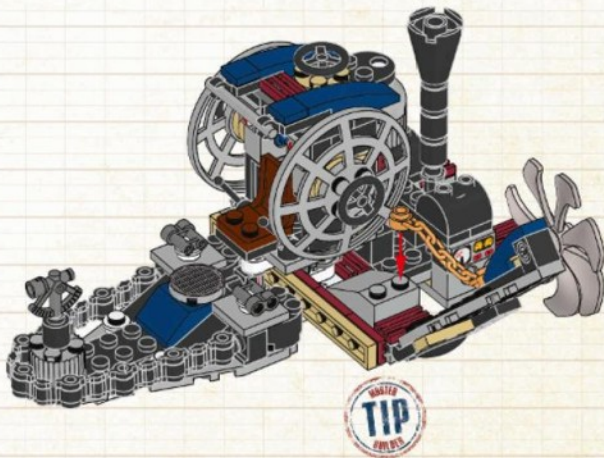
Not every invention detail needs to be purely for a mechanical function. This brass chain is a decorative *STORY BUILDING* detail that places your Time Machine in its steampunk setting.

STEP 19.6 TECHNIQUE: MACHINERY!

Moving, functional parts are important components for machines. This spinning propeller will make it really look like your Time Machine can do something cool. The metallic silver color gives it the *MATERIALS* look of polished steel, too.

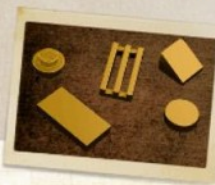


20



ALL THAT GLITTERS

How about an invention that looks old-timey? Smooth lines and curves are nice and futuristic, but for a classic, classy steampunk look, try using metallic elements as accent decorations. Look through your collection for LEGO® elements with a gold tint and use them to add some extra details onto your model. They don't have to do anything – they're just there to look stylish!



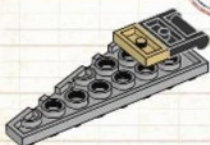
STEP 20 TIP: ANGLE OF ADVENTURE

A handle-plate and clip attachment connects your Time Machine's wing, and the chain holds it at just the right angle to catch temporal winds and keep the propeller from hitting the ground when it touches down in new time zones.





21.1

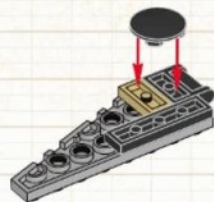


STEP 21.1 TIP: UNDER PRESSURE

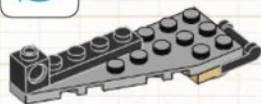
By placing your wing's handle-plate connector below the angled wing-plate instead of on top, you make it less likely to pop off when you push down on the wing from above.



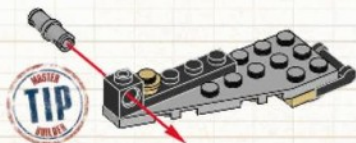
21.2



21.3



21.4

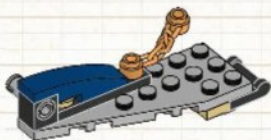


STEP 21.4 TIP: RAPID ROTATION

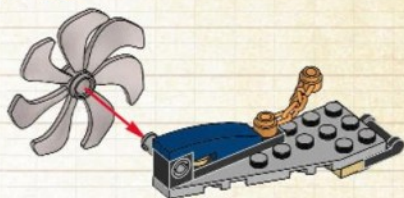
Want your moving mechanical components to spin freely? Make sure you attach them with non-friction Technic connector pins like this gray one. Black pins use friction for a tighter fit and won't give you the same amount of spin.



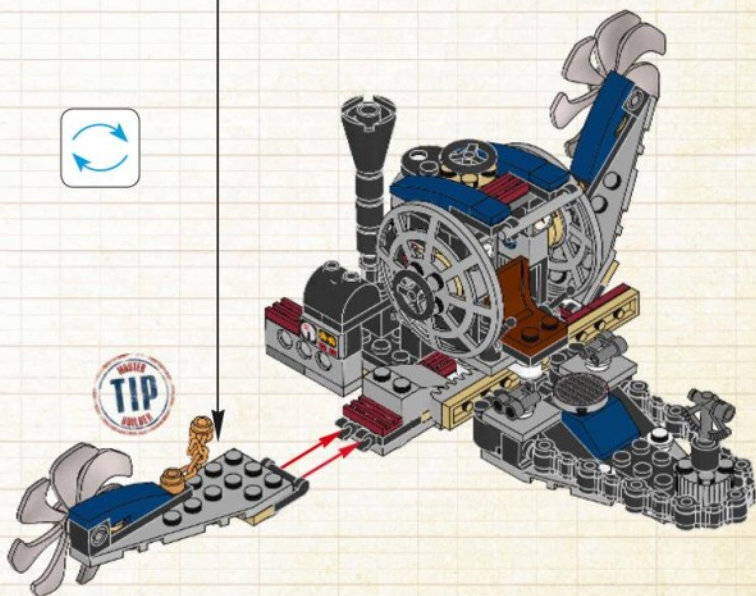
21.5



21.6



21

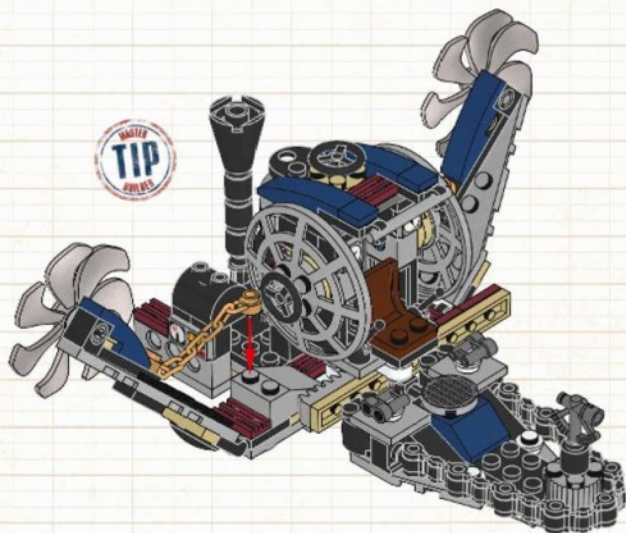


STEP 21 TIP: BUILD YOUR STORY

An invention can be as simple or complicated as you like, but the more that's going on in your model, the more fun it will look. Without its wings, the Time Machine would still have its steampunk engines and spinning pilot capsule...but with them, it really looks like it can take off and have an exciting adventure!



22

**STEP 22 TIP: WINGS UP, WINGS DOWN**

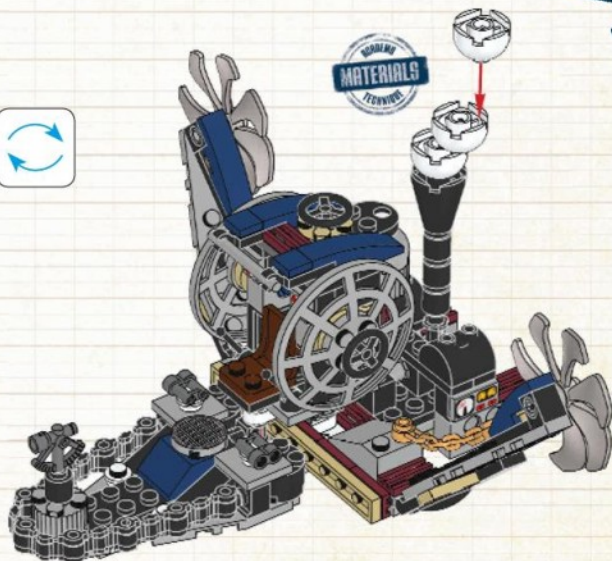
Mirroring your wings gives your creation **BALANCE**, but since they're on clip-hinges, you can still modify the Time Machine's **SHAPE**. Fold the wings up for storage, or swing them down when you're ready to cruise through time.





3x

23

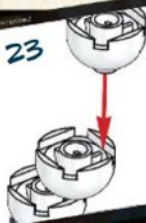


YOUR TIME MACHINE INVENTION IS COMPLETE! NOW PUT YOUR MINIFIGURE INVENTOR IN THE PILOT'S SEAT, PUT THE KEY IN THE IGNITION, AND TAKE IT FOR A WILD SPIN THROUGH TIME AND SPACE!

STEP 23 TECHNIQUE: MATERIALS!

With the right LEGO® elements, you can create any material – even puffs of steam! To add a cloud of smoky white vapor coming out of your Time Machine's chimney, make a staircase-like stack of upside-down white domed bricks. Be warned: this special effect looks great, but it isn't very stable. Handle with care and be prepared to reattach it when necessary!

STEP 23



CONGRATS...
YOU'RE DONE!

Kit 10

SPRINGBOARD MODELS

Springboard models are special LEGO® builds created to inspire you to make even bigger and better models around them. Some springboards can be built right into a model to give it more detail and more opportunities for story-telling interaction with your minifigures. Other springboards are separate objects that help to establish a specific styling and setting for a larger model or scene – the way these **STEAMPUNK SPRINGBOARDS** will help you imagine and invent your own steampunk world!

Each of the Kit 10 springboard models was designed by the LEGO Master Builders to spark your inventive creativity and get you building your own new steampunk models using the advanced techniques of **MACHINERY** and **MATERIALS**. But while the LEGO Master Builders provided the building instructions, how you use each springboard – and the role it will play in your Time Travel story – is totally up to you.

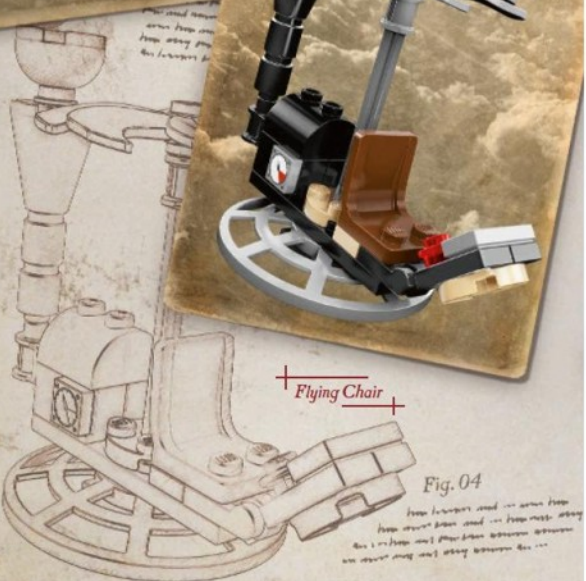
You'll find building steps for four all-new steampunk springboard models on the following pages of your handbook, and instructions for six more on the LEGO Master Builder Academy website!



Fig. 03

Use black axle from inside from box in box. It is a gear.
 Make using two from LEGO parts and in the workshop
 from two 1/2 inch from box.

+ Rocket Pod +



+ Flying Chair +

Fig. 04

Use LEGO parts and in your own
 from LEGO parts and in your own workshop
 Use 1/2 inch and from LEGO parts and in
 use LEGO parts and in your own workshop.



Self-Propelled Boat



Aerial Exploration Glider

Fig. 10

...the prop and motor from 1 to 20
 from using other prop from ...
 the ... from 1 to 20 ...
 the ...



Photon Accelerator

Fig. 08

...the prop and motor from 1 to 20
 from using other prop from ...
 the ... from 1 to 20 ...
 the ...



Automated Sawmill



YOU'LL FIND **BUILDING INSTRUCTIONS** FOR ALL OF THESE
 SPRINGBOARD MODELS AT YOUR **KIT TO DESK** ON [LEGOmba.com!](http://LEGOmba.com)

one



Steam Engine

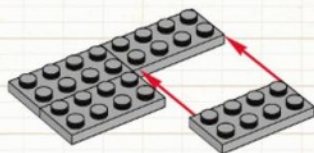
At the core of almost every steampunk vehicle is its most important component: the engine that provides its power. That's why there's no better Invention Designer springboard to start out with than the mighty Steam Engine itself!

You can build this small but vital device directly into your invention models, or just include parts of it like the controls or smokestack to show that there's something chugging away in there. You can even build it on its own and place it in a factory or other industrial scene!



4x

1



1x

2



STEP 2 TECHNIQUE: MATERIALS!

This steam engine is going to be made (or at least look like it is) almost entirely out of iron. That means black bricks from top to bottom, starting with this plate on the ground. It also **LOCKS** together your four-piece base plate underneath.

2X

1X

3



2X

2X

1X

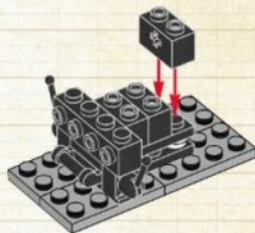
4



1X

3X

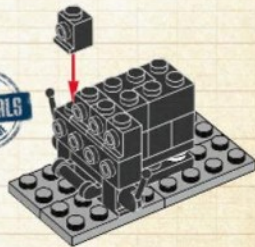
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2X

4X

6



STEP 4 TECHNIQUE: MACHINERY!

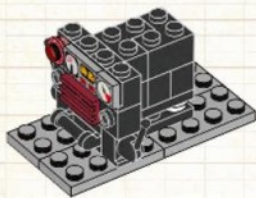
Knobs, levers, and other machinery *DETAILS* will make your inventions look more real and functional. By attaching two mini-antennas to your model, you give your inventor controls that he can use to open up vents, smoke chambers, and the firebox door.

STEP 6 TECHNIQUE: MATERIALS!

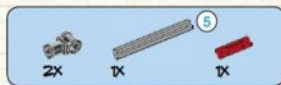
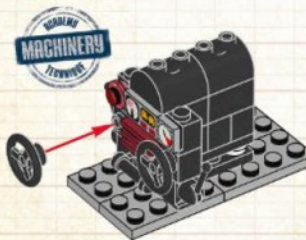
Keep piling on the black bricks to build a solid chunk of iron. Normally, you'd design a color scheme by using at least two major colors on a model's body, but by keeping it to one, you create the illusion of mass. This makes your model look big and heavy, even through it's really small and lightweight.



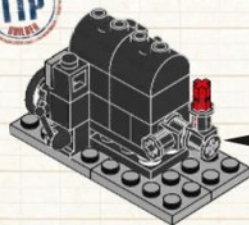
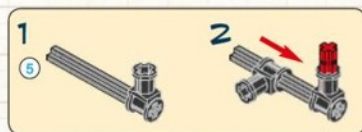
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**STEP 8 TECHNIQUE: MACHINERY!**

The completed control panel has a red-hot firebox for wood and coal to keep the engine running. Thanks to the old-fashioned wheels and gauges you've added, you can tell right away that this is an industrial machine, not a futuristic one.

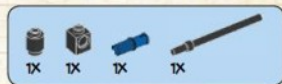
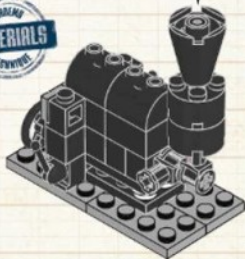
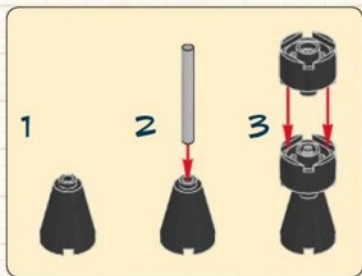
STEP 9 TIP: PLAN FOR STRENGTH

In **STEP 5**, you placed three bricks with cross-axle holes in front of each other. Now give your future smokestack a strong foundation by sliding a LEGO® Technic cross-axle through all three of them.

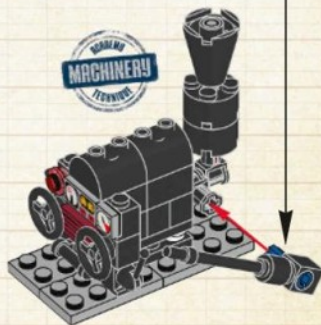
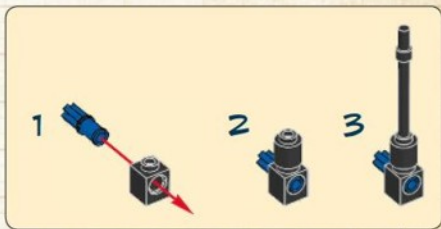




10



11



STEP 10 TECHNIQUE: MATERIALS!

Many chimneys are made of brick or stone, but this one is made of black iron like the engine it's attached to. Round, smooth bricks will give the impression of metal plates that have been crafted into a tube. A bar through the center provides **STABILITY** and shows off a special technique for connecting the cone upside-down!

STEP 11 TECHNIQUE: MACHINERY!

This engine just needs one more machinery detail: a lever to control its internal pressure by releasing built-up heat and steam. A friction-style LEGO Technic connector makes the rotation point tight!





Horseless Carriage

It's hard to believe, but true – thanks to the modern wonder of the steam engine, this wheeled transport conveyance travels without any need of a horse to pull it along!

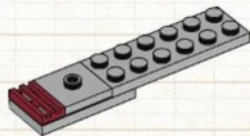
One of the most fun parts of designing alternate-history inventions is getting to recreate the past in a whole new way. This might be a steampunk inventor's vision of an automobile: a tractor-like machine with big wheels in front, small ones in back, and a giant steam engine to provide its power. It's a springboard to help you imagine your own new versions of old technology!



1

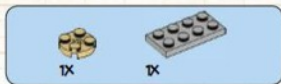


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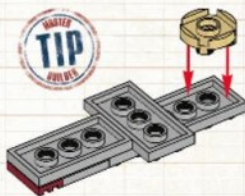


STEP 1 TECHNIQUE: MATERIALS!

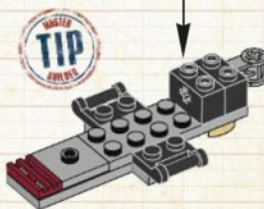
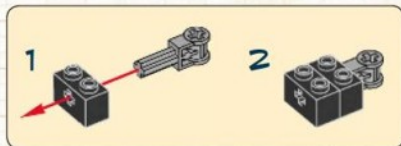
Start your model out with its first detail: a grille to catch the soot from its chimney. Red not only adds a bit of color to a largely-black invention, but makes it look like metal that's been rusted by time and the elements.



3



4



REAL-WORLD INSPIRATION

Even when you're building an imaginary invention, you can make it look more believable by using real machines for inspiration. The Horseless Carriage's design is a mixture of an old-fashioned steam locomotive and a farm tractor. Take a look at how the LEGO® Master Builders blended their details together to make something original and new!



STEP 3 TIP: ON THE LEVEL

The Horseless Carriage rolls on two pairs of very differently-sized wheels. To keep it even, you want to make sure that the bottom edges of the wheels rest on the same level, so lower the rear wheel-base with a 2x2 round plate.

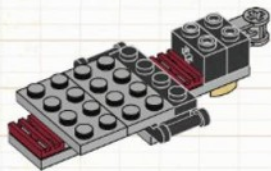
STEP 4 TIP: CARGO CAPACITY

The Horseless Carriage's design was partly inspired by a train engine, so why not give it a way to tow something behind it? You can plan ahead by giving your model a trailer hitch with this LEGO® Technic catch piece.





5



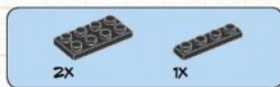
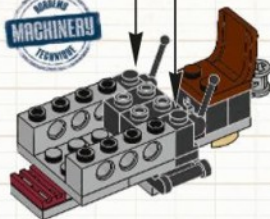
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**STEP 6 TIP: DRIVER'S-EYE VIEW**

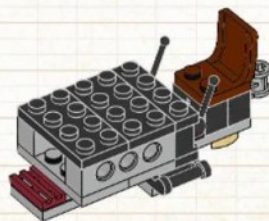
Thanks to the big steam engine at the front of the vehicle, your Minifigure driver might have trouble seeing the road ahead. Give him a boost by placing his seat up on top of these bricks!



7



8

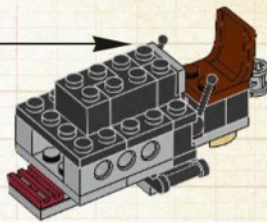
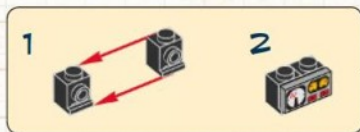
**STEP 7 TECHNIQUE: MACHINERY!**

Attach mini-antennas to a pair of Erling bricks to make movable control levers that your inventor can reach from his seat. Technic bricks with holes provide an air-cooled base underneath the hot engine, too.

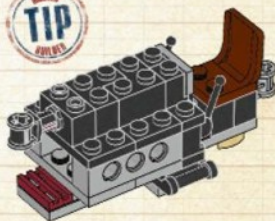




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10



STEP 9 TECHNIQUE: MACHINERY!

Nowadays, new inventions usually have simple and streamlined controls. For a steampunk model, though, the more complex the controls and readouts, the better! That's why you're using this decorated tile to give the Horseless Carriage a dial-covered dashboard.

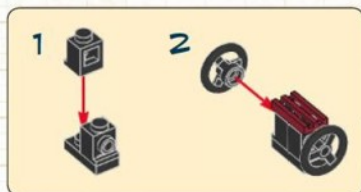
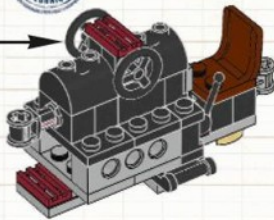
STEP 10 TIP: MAKE A SOLID BASE

One thing that's common to most chimneys is that they're tall and thin. When you're building a LEGO® model, that means you need to add as much **STABILITY** as possible. A Technic catch with cross-hole will give this smokestack a strong foundation.

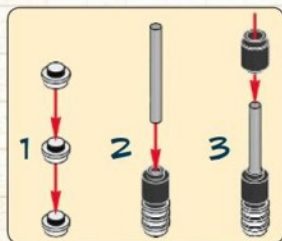
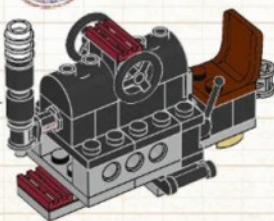




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12


**STEP 11 TECHNIQUE: MATERIALS!**

Top the engine off with curved black bricks to make it look like it's built out of tough iron plates...and just to be on the safe side, add a pair of pressure-release wheels as **MACHINERY** details to make sure the boiler doesn't build up too much steam and go kabloolie.

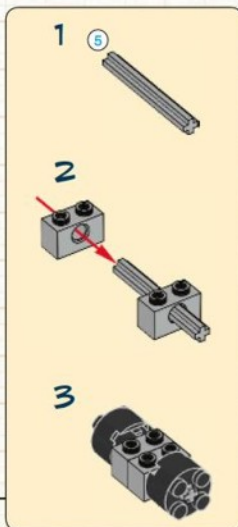
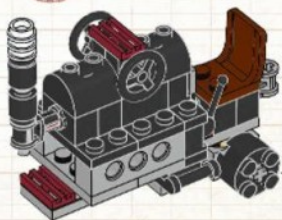
STEP 12 TIP: SMOKE-STACK

Here's a simple way to build a steam effect that makes it look like the Horseless Carriage is chug-chug-chugging along. Give your invention a smoking iron chimney by stacking three 1x1 round white plates onto two 1x1 round black bricks, with a bar through the center for strength.





13



WHEEL OPTIONS

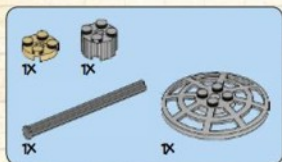
This is just one example of how you can make your own small wheels. Want another one? Start with the same two bricks-with-holes, but instead of round bricks and a cross-axle, use this kit's valve wheels and a pair of Technic connectors with pins on one end and studs on the other from your LEGO® brick collection. They'll give you the same even ride, but with a narrower wheel-base and a different *STYLING!*



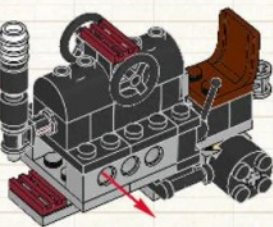
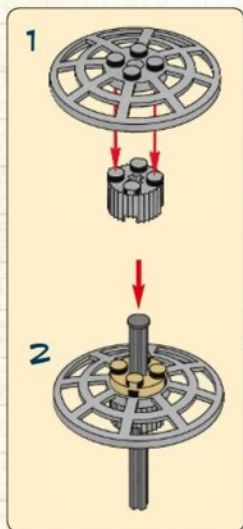
STEP 13 TIP: WHERE THERE'S A WHEEL, THERE'S A WAY

In your Kit 6 Auto Designer handbook, you practiced using LEGO wheels to make rolling vehicles...but you can create your own wheels from other pieces, too! Slide a cross-axle through two Technic bricks with single holes to make a wheel-base, and then put a 2x2 round brick on each end to make a simple pair of small wheels. The cross-holes in the round bricks *LOCK* the axle in place.





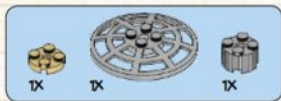
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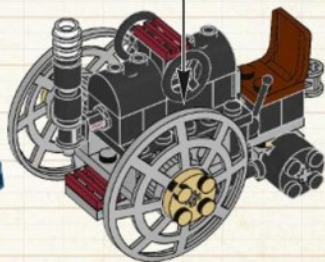
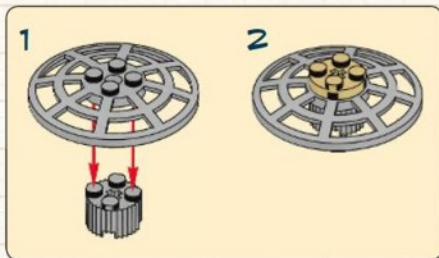
STEP 14 TIP: BIG ROLLER

Old-fashioned bikes of the late 1800s, with a big front wheel and a tiny back wheel, are called penny-farthing bicycles after the two different-sized old British coins their wheels resemble. You can capture that steampunk-era *STYLING* by giving the Horseless Carriage a pair of giant wheels to support the weight of its steam engine. The bigger the front wheels, the faster your invention will be able to roll!





15



YOU'VE CREATED A BRAND-NEW INVENTION:
A STEAMPUNK TRANSPORTATION MACHINE
THAT ROLLS WITHOUT A HORSE! SO WHERE
WILL YOU BE DRIVING TODAY?

STEP 15 TECHNIQUES: MACHINERY & MATERIALS!

For the final step, combine your Kit 10 techniques. The grooved round bricks inside the wheels look like the functional gears of built-in machinery, and the open spaces in the big gray radar dishes create the appearance of reinforced spokes made of titanium or other strong materials. Now that's an invention!



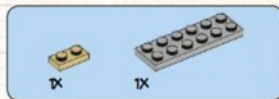
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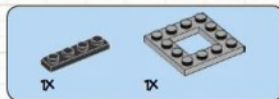
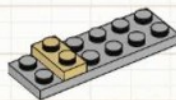
MAD SCIENCE RAY

Just one look at the Mad Science Ray and you can tell that it was built for something big. With a control panel covered with wheels, dials, levers and gauges, and an emitter dish angled up at the sky, it must fire one impressive zap...but what happens next?

Does it repel alien invasions? Carve the user's initials into the Moon? Control the weather? Or can it do all of those and more? When you're designing your own fantasy inventions, you get to be the mad scientist – so the answer is up to you!



1



2



STEP 2 TIP: MULTI-LEVEL MACHINERY

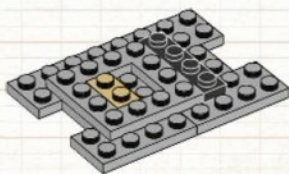
Just like a second color can make a plain model look more interesting, multiple levels can do the same for flat surfaces. This open-centered plate creates a raised platform that will draw attention to your invention's control station.





4x

3



1x



1x



2x

4



2x

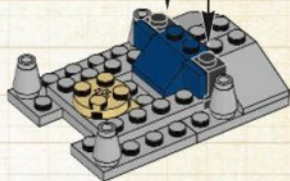
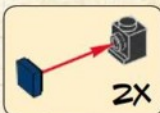


2x



4x

5



2x

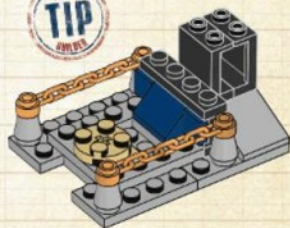


1x



2x

6



STEP 4 TECHNIQUE: MATERIALS!

The base of this invention is mostly made out of aluminum and steel, hence all the gray pieces. Start the control panel out with a blue **SUPPORT ELEMENT** to represent painted metal – because painted materials can be any color you want!

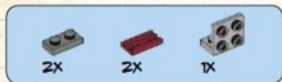
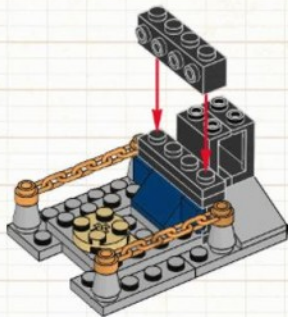
STEP 6 TIP: KEEP AWAY

You don't want just anybody messing with your Mad Science Ray, do you? Send a "Hands Off!" message with a pair of golden metal chains as a **STORY BUILDING** detail to keep the controls secure.

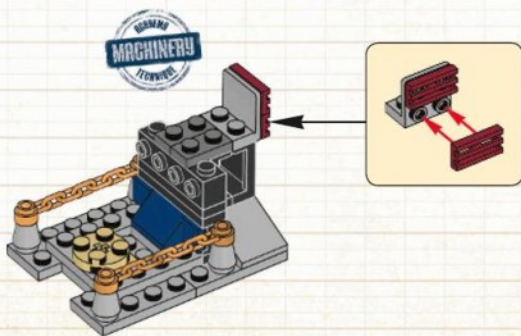




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**STEP 8 TECHNIQUE: MACHINERY!**

This may be an imaginary invention, but it should still resemble a functional machine, and that means it needs to expel built-up heat. Use **SIDWAYS BUILDING** to add some grilles at the front for vents...after all, you don't want super-hot steam blowing back in your Minifigure's face!



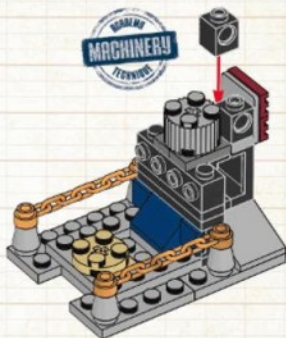


2x



1x

9



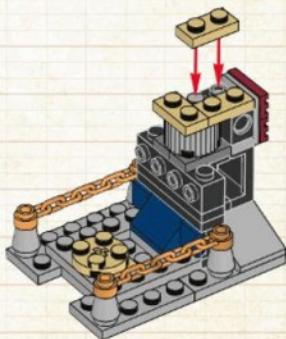
SCI-FI DEVICES

The Steam Engine and Horseless Carriage were both believable inventions, but just like the Time Machine, the Mad Science Ray is something that comes straight out of science fiction. It's easy to find resources to help you design realistic machines, but when making up your own inventions, it's especially important to use the **MACHINERY** and **MATERIALS** techniques to add **DETAILS** that make it look like it can really function...whatever it is that it does!



3x

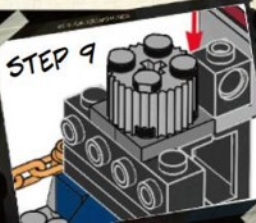
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STEP 9 TECHNIQUE: MACHINERY!

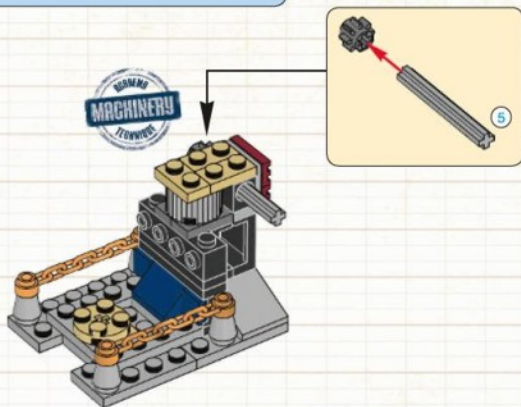
The best mechanical details look like they do something. This grooved 2x2 round brick may not actually rotate, but built into your machine's base, it creates the effect of a geared column that controls which way the Mad Science Ray is pointing. Meanwhile, the two 1x1 LEGO® Technic bricks with holes provide an attachment point for another machine detail that you'll be adding soon.

STEP 9

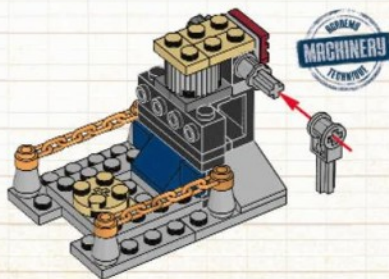




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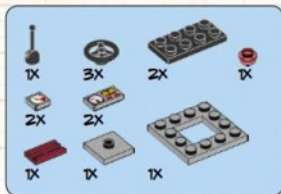
**STEP 11 TECHNIQUE: MACHINERY!**

This technique is about building details that look like they really work...and some of the best pieces for making functional-looking machine components are **LEGO® TECHNIC ELEMENTS**. Use a gear and a cross-axle to build the base of a master control lever!

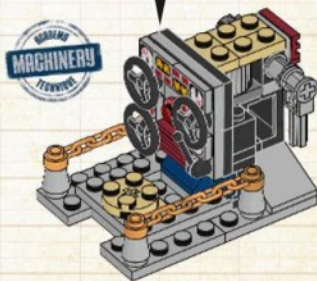
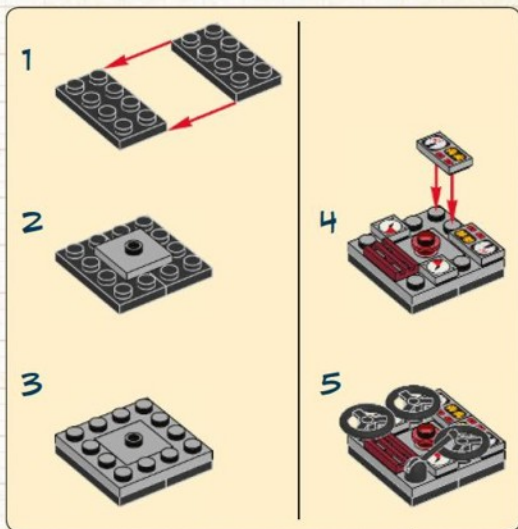
STEP 12 TECHNIQUE: MACHINERY!

LOCK the rotating base into your machine with a Technic bush, and complete it with a catch on the end to make the lever's handle. This interactive component makes a great **STORY BUILDING** detail for your invention.





13



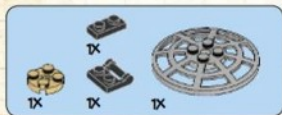
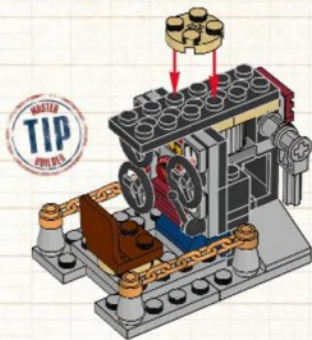
STEP 13 TECHNIQUE: MACHINERY!

Time to create a really complicated control panel! By packing lots of machinery *DETAILS* all together in a relatively small space, you make the Mad Science Ray look like it takes a lot of expertise to control. Check out all of the different readouts and controls for your inventor to play with... and right in the middle is a red warning light to let him know if everything's working right – or going terribly (or hilariously!) wrong.

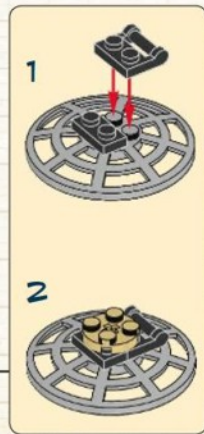




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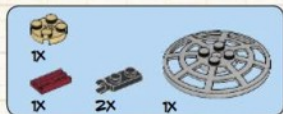
**STEP 14 TIP: SCIENCE TAKES TIME**

It can take a while to get all of the Mad Science Ray's dials, wheels and levers lined up just right, so provide your inventor with a place to sit down while he fiddles with the controls.

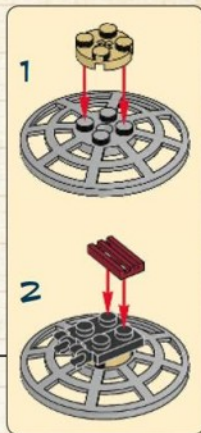
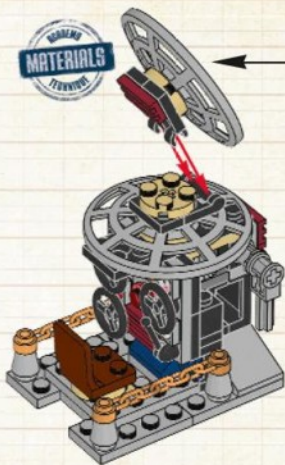
STEP 15 TECHNIQUE: MATERIALS!

Big pieces of metal are strong, but they're also heavy. By using a metal-colored element with holes in it, like this radar dish piece, you keep the look and strength of metal, but remove some of the extra weight so your invention can operate smoothly.

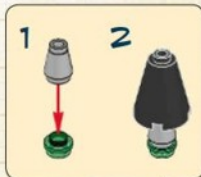
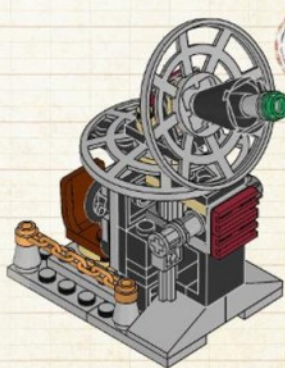




16



17



NOW THAT YOU'VE COMPLETED THE MAD SCIENCE RAY, USE IT AS A SPRINGBOARD FOR BUILDING AN ENTIRE MAD SCIENCE LABORATORY AROUND IT!

STEP 16 TECHNIQUE: MATERIALS!

Use a second radar dish to create the Mad Science Ray's emitter dish, which lets it aim its super-powerful ray. Before, this device's base could have been almost any kind of machine...but now it really looks like a sci-fi invention!

STEP 17 TIP: THE FINAL ELEMENT

The radar dish and the cones work together to create the *SHAPE* of a machine that fires a focused beam, but the crowning touch is the green piece at the end that creates the look of an exotic energy source.

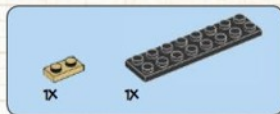




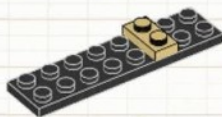
HOVER-MOBILE

When designing a new invention, think about what you'd like to have yourself. It might be a new kind of utensil...or a special method for seeing across long distances...or your own flying car!

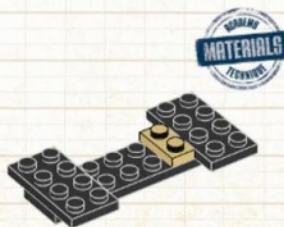
The One-Minifigure Personal Levitation Device (a.k.a. Hover-Mobile), is a perfect example of steampunk design. It does something imaginative and hi-tech, but it has the old-fashioned details of the historical Victorian era. Together, those features give it its own uniquely unusual look and style!



1

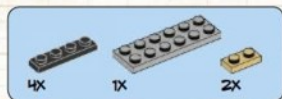


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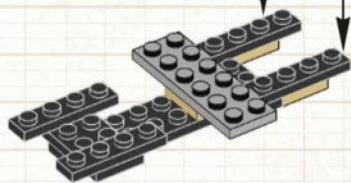
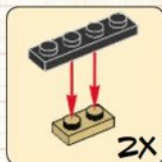


STEP 2 TECHNIQUE: MATERIALS!

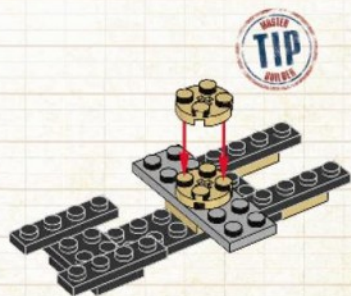
Just like when you design an Auto model (see Kit 6), start out by creating a strong support structure for your imaginary vehicle. Black plates make a sturdy iron frame to carry the weight of the machinery and pilot on top!



3

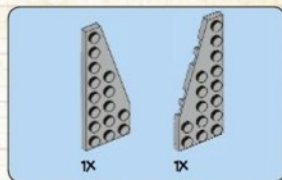


4

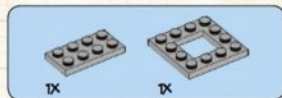
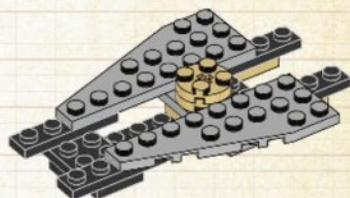


STEP 4 TIP: INVENT AHEAD

2x2 round plates have a LEGO® Technic cross-axle hole in the middle. By stacking two together, you create a connection base for a vertical axle to be added later in your build.



5



6



STEP 6 TECHNIQUE: MATERIALS!

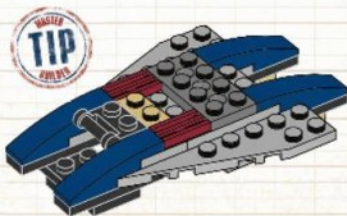
Mix gray and brown elements to create the appearance of wood and aluminum for a strong but lightweight flying vehicle. A combination of different building materials makes a steampunk invention look extra classy!



7



8

**STEP 7 TECHNIQUE: MATERIALS!**

A dark gray steel plate adds some extra color to the Hover-Mobile's metallic top. Its holes keep this section from looking too heavy and bulky, and by lining up the central hole over the ones below, you're providing even more reinforcement for a Technic cross-axle.

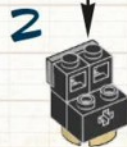
STEP 8 TIP: ANGLED CONTROLS

A plate with handle at the front will give you a good place to clip on a control panel and raise it to the right angle for your Minifigure inventor to use. At the same time, add some *COLOR* to your machine with painted-looking curved slopes and grilles.



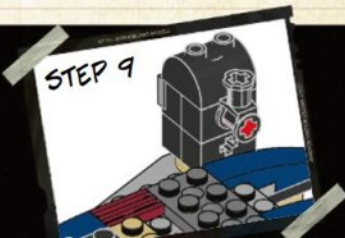


9



STEP 9 TECHNIQUE: MACHINERY!

It takes a lot of power to keep a flying contraption in the air when all you've got is steam-based technology. Use the **MATERIALS** technique to build a boiler engine that looks like it's made out of black iron, and attach a printed plate with readouts to help your inventor keep an eye on the pressure building up inside.





10



1



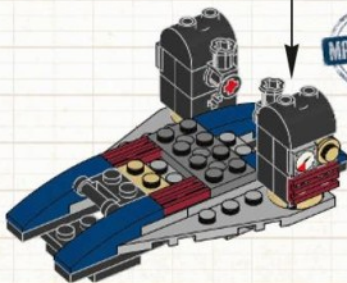
2



3



4



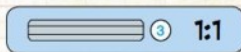
STEP 10.3 TIP: TECHNIC-OLGY

Combine standard and LEGO® TECHNIC ELEMENTS to create MACHINERY details that take your creations in unexpected new directions!

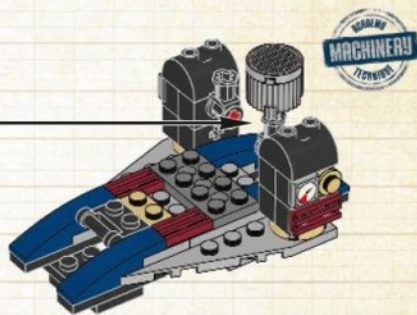
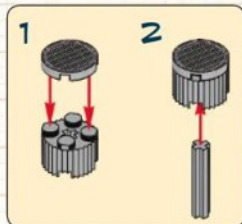
STEP 10 TECHNIQUE: MACHINERY!

Although the overall SHAPE of this second boiler is the same as the first, its individual DETAILS are changed. This gives the Hover-Mobile a mostly symmetrical appearance for model BALANCE, but with mechanical parts that seem like they're designed to do different things, making for a more interesting-looking invention.

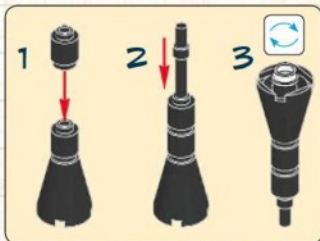




11



12

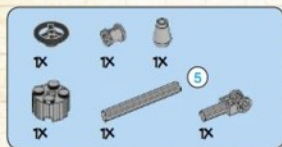


STEP 11 TECHNIQUE: MACHINERY!

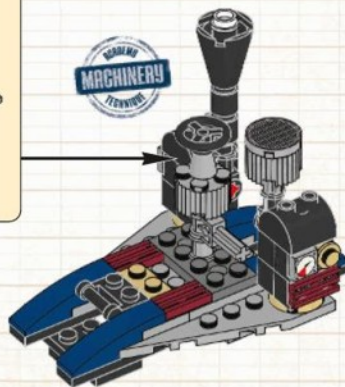
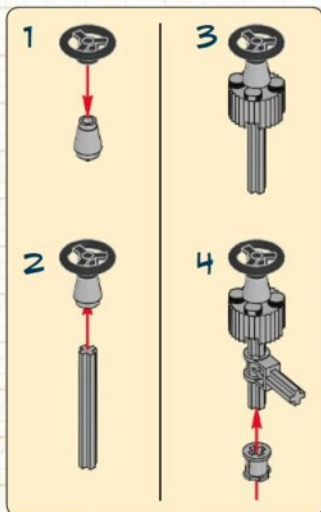
Combining two unusual pieces can give you one great new mechanical component. Here, a decorated round tile on top of a grooved round brick creates a fluted vent with a particle filter on top!

STEP 12 TECHNIQUE: MATERIALS!

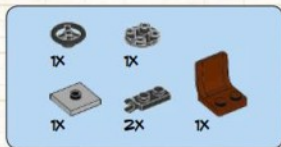
Your boiler's chimney will get hot, so build it out of tough iron-black bricks with a pole in the center for strength and a small puff of steam at the top. This structure balances the vent on the other side, but adds an extra element of asymmetrical detailing to make the Hover-Mobile look like it was assembled out of spare parts.



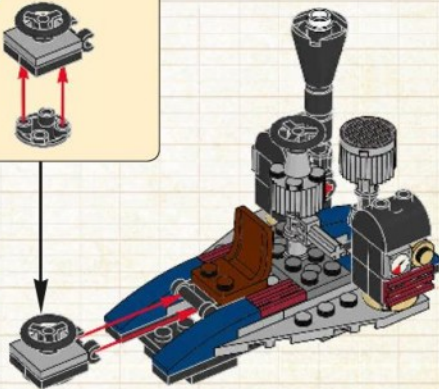
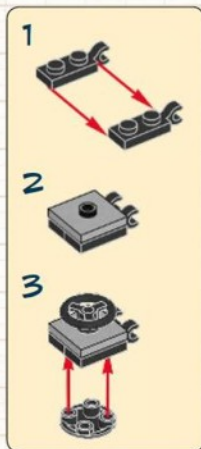
13

**STEP 13 TECHNIQUE: MACHINERY!**

Time for those stacked cross-axle holes to pay off! Once again, combine standard and LEGO® Technic parts to create a simple-to-build but complex-looking mechanical detail that definitely seems like it serves an important function in your machine. A Technic catch sticking off the side will let you add additional components, and the wheel on top gives your inventor an old-fashioned but practical way to make fine adjustments to the Hover-Mobile's performance.



14



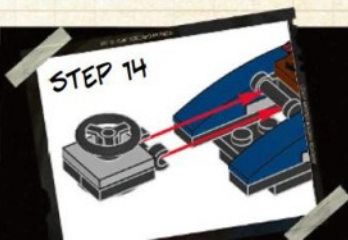
SMOKE AND STEAM

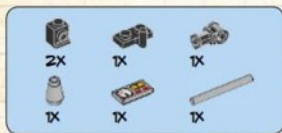
Smoke and steam effects on top of a chimney, vent or smokestack are great for making a model look like it comes from an industrial setting like a steampunk universe (they're good for factory machines, too!). Take a look at photos of real smoke and see what elements from your collection of bricks would be best for recreating its **COLOR** and **SHAPE** on your own creations!



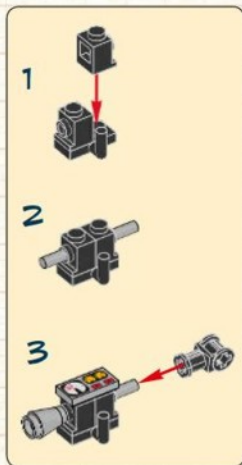
STEP 14 TECHNIQUE: MACHINERY!

The key to a believable-looking fantasy invention is to give it a few recognizable and familiar components so it doesn't seem totally impossible. The Hover-Mobile may fly through the air with the help of a steam-generated antigravity current, but your Minifigure inventor drives it just like you would drive a car – with a steering wheel!

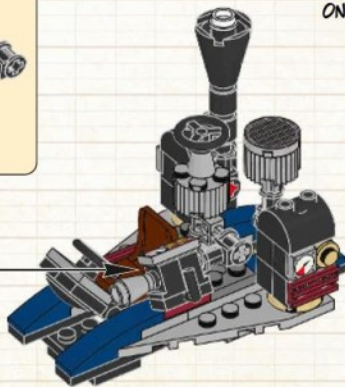




15

**BONUS TIP:**

THE DECORATED MACHINERY DETAIL TILE ADDED IN THIS STEP IS DESIGNED TO WORK UPSIDE-DOWN, TOO - THE NUMBERS WRITTEN ON IT SAY EITHER "28" OR "82" DEPENDING ON WHICH WAY YOU'RE LOOKING AT THE READOUT!

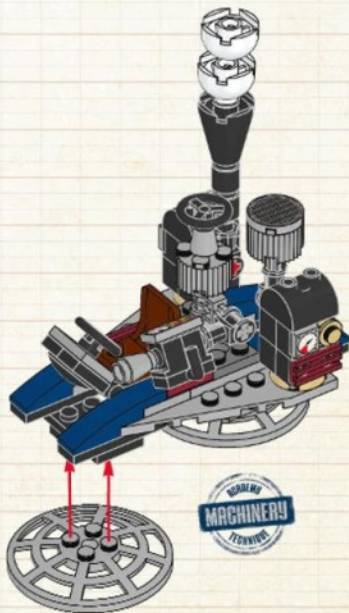
**STEP 15 TECHNIQUE: MACHINERY!**

A steering wheel only lets you turn left or right, and the Hover-Mobile needs to move up and down as well. Add some extra controls – plus a horn to make sure you don't crash into any flocks of birds – by building a console to go next to the pilot's seat. A bar piece inserted into a Technic cross-axle hole lets it rotate to a convenient angle.





16



NOW THAT YOU'VE MADE THE HOVER-MOBILE, TRY BUILDING A WHOLE AERIAL ADVENTURE SCENE AROUND IT!

STEP 16 TECHNIQUE: MACHINERY!

Now the Hover-Mobile needs some details to really make it look like it could fly. Use the **ALTERNATIVE USES** technique to transform a pair of radar dishes into antigravity repulsion projectors designed to lift your amazing invention off the ground – and complete the model with an angled stack of upside-down white domes to create a trail of steam from the engine's smokestack.



LEGO® Fan Creations!

STEAMPUNK SPRINGBOARDS

You can usually tell a steampunk model just by looking at it, but every builder also has a unique style all his or her own. If you need proof, just take a look at these awesome springboard models built by inventive LEGO® fans from all around the world! Even though each one was designed to enlarge or enhance a bigger steampunk scene, they all have different details and use different techniques.

MODULAR STEAM MACHINE
BY HOLGER MATTHES
(GERMANY)



SEE HOLGER'S CREATION
IN ACTION IN THE KIT TO
DESIGN JOURNAL ON

LEGOmba.com



STEAMPUNK AUTO
BY STEPHAN SANDER
(GERMANY)



HOVER CRAFT
BY CECILIE FRITZVOLD
(NORWAY)



TIME DEVICE
BY STEPHAN SANDER



SUPER STEAM BOILER GRAND PRIX CAR
BY CHRISTOFFER BEHRENS
(DENMARK)



STEAMPUNK WORKSHOP
BY CECILIE FRITZVOLD

VISIT LEGOmba.com FOR EVEN MORE
LEGO® FAN SPRINGBOARD CREATIONS!

Kit 10

TIME TRAVEL CHALLENGE!

INVENT A TIME TRAVEL SCENE!

Now that you've learned about designing detailed mechanical models like this kit's steampunk sci-fi creations, it's time to put your new Invention Designer skills to the test and build your own custom LEGO® brick creation for the first Design Challenge of Level 4!

THE CHALLENGE

Use your collection of LEGO elements to create an awesome Time Travel scene! It can take place at any point in history, from the prehistoric past to the far-flung future. Just make sure you include details that make it clear when and where your scene is from.

Whatever (and whenever) you decide to build, include your Level 4 LEGO MBA Minifigure somewhere in the scene – and design an invention for him to use on his time-traveling adventure.

Your invention can be as big as a time machine or as small as a new Invent-o-Pack gadget. Remember to use the LEGO Master Builder techniques of **MACHINERY** and **MATERIALS** to make it look like a functional mechanical device!

PLOT YOUR COURSE

To take part in the Kit 10 Design Challenge, you need to have registered your Level 4 membership at www.LEGOmba.com using the code printed on page 5 of this handbook.

Once you're signed in, visit your **KIT 10** desk, click on the **TO-DO LIST**, and select the **TIME TRAVEL DESIGN CHALLENGE**. Then just follow the instructions for taking and uploading pictures of your new invention creation!





CHRONO-CREATING

TIPS FOR DESIGNING A TIME TRAVEL MODEL!

1



2



3



4



01. WHEN AND WHERE

Start out by deciding where in time and space your time travel model will take place. It could be any point in history, so narrowing things down may not be easy. Once you've picked a destination, find out as much as you can about that time. What kinds of people, creatures, buildings and environmental features will your time traveler be likely to encounter? Use that information to add recognizable details to your scene so viewers can identify it!

02. THE MISSION

Think about why your time traveler has made this amazing journey. Is he a scholar who wants to learn about famous events, a scientist searching for the answer to an age-old mystery, an explorer hoping to discover new and exciting frontiers, a treasure-seeker hunting for forgotten riches, or someone on a quest to change history by altering the past...or has he gotten there by accident and just wants to find his way back home?

03. THE EVENTS

Now that you know when your scene takes place and what your traveler is doing there, figure out what's going to happen when he arrives. Will he disguise himself and observe the past unnoticed, or will he be drawn into the action? Will he have to battle unexpected foes, or team up with famous figures from history? Place him in your scene in a way that makes it clear how he's interacting with the past – or the future!

04. TECHNOLOGY

Trying to figure out what kind of invention to make? One of the most fun parts of building a time travel model is designing a method for your explorer to move through time. It could be a flying machine, a hand-held device, a mysterious ancient portal, or even a huge laboratory full of equipment. When you've decided what kind of technology to employ, use what you've practiced with the Machinery and Materials techniques to build something that looks both interesting and functional!

YOU'LL FIND EVEN MORE **TIPS AND IDEAS** ON THE FOLLOWING PAGES
AND AT YOUR **KIT TO DESK** ON LEGOmba.com!

A BRICK HISTORY OF TIME

BUILDING HISTORY WITH LEGO® MODELS!

Not sure what time period to feature in your next Time Travel model? All of the past, present and future are wide open to you – just take a look at these LEGO® designs from all throughout history and try to spot an era that inspires you to build something truly inventive!

These sets were designed more for fun than fact, but you can research real history to make your own models as accurate as you like!

DON'T FORGET TO
POPULATE YOUR TIME
TRAVEL MODEL WITH
CHARACTERS FROM THAT
POINT IN HISTORY!



*Ancient
Egypt*



*Medieval
Times*



Prehistory



ONCE YOU HAVE SOME IDEAS, START BUILDING TIME TRAVEL SCENES!



Exploration



The Future



Modern Day



High Seas



DESIGNING STEAMPUNK MODELS

A LEGO® MASTER BUILDER'S CUSTOM CREATIONS!

You met him in LEGO® MBA Kit 3 – Robot Designer, and now LEGO Master Builder and designer Mark Stafford is back to share more of his fantastic sci-fi creations. Here's how Mark designs his own custom STEAMPUNK models in between working on new LEGO sets and themes!

This is my **TRI-TERRORTOPS**, a steam-powered, dinosaur-shaped walking vehicle. It includes many of the iconic details of steampunk: huge cast-iron drive wheels, chimney stacks, brass accents, a big boiler, large rivets and bolts, and visible gears (including a 40-year-old big red LEGO® Technic cog!). Remember to include minifigure drivers and passengers, and choose them carefully to help evoke the retro-futurism that we're aiming for.

Fig 14.

the gear is used for the main drive and the other two are used for the front legs and the back leg.

the main gear is used for the main drive and the other two are used for the front legs and the back leg.

I like to avoid using too many rusty brown colors in my steampunk models. Try searching for pictures of real Victorian machinery and you'll see that it was always kept oiled and painted bright colors to keep rust at bay. Rust is the biggest enemy of machinery, and a well-maintained machine should have none. Brown pieces should mainly be used to represent wood; in a world without petroleum, there is no plastic, so many of the parts we might expect to see in molded plastic would be carved out of wood instead. Of course, this means that in a steampunk world there are no LEGO bricks – maybe it's not such a great place to live, after all!



Fig 15.

the main gear is used for the main drive and the other two are used for the front legs and the back leg.

the main gear is used for the main drive and the other two are used for the front legs and the back leg.

the main gear is used for the main drive and the other two are used for the front legs and the back leg.

"STEAMPUNK IS A GENRE OF FICTION THAT SPECULATES ABOUT WHAT WOULD HAVE HAPPENED IF THE INTERNAL COMBUSTION ENGINE HAD NEVER REPLACED THE STEAM ENGINE. WHAT IF THE VICTORIANS HAD MADE TECHNOLOGICAL LEAPS THAT IN REALITY DIDN'T HAPPEN UNTIL THE 21ST CENTURY? HOW WOULD THE WORLD OF JULES VERNE AND H.G. WELLS HAVE LOOKED WITH CLOCKWORK COMPUTERS AND STEAM-POWERED ROBOTS? START LOOKING AT YOUR BRICKS NOT ONLY AS STRUCTURAL AND SHAPING PIECES, BUT ALSO AS ELEMENTS THAT EVOKE A THEME - LIKE THE WONDER, ADVENTURE, EXCITEMENT AND AMAZING TECHNOLOGY OF THE VICTORIAN STEAM ERA IN A SPECULATIVE FANTASY FUTURE!"

- LEGO DESIGNER MARK STAFFORD

On the other hand, you can also use rust coloring to add story-telling details. The Rusty Tick is a land-pirate walker, and as you can see I chose to use brown elements on the fairing of the legs, but not on the machinery inside. I figured that pirates might not want to use bright colors or take very good care of their machines, letting them rust in unimportant areas because they can just steal a new one if the original starts to fall apart!

Many steampunk worlds feature airships and zeppelins in their skies. They look amazing, but the challenge of building large gas-bag vehicles generally requires huge LEGO brick collections! Smaller flying machines such as this Ornithopter (a vehicle that flies by flapping its wings) can be built from more modest collections so long as they include the important shape, color and decoration details that tell you they are a part of a steampunk future.

Once you have the skill to create your own steampunk inventions, it will serve you well as you continue to build. The next time you imagine a new time and place, think carefully about the technology and styling of that world, how you are going to represent it in your creations, and what details you should include across all of your models to be consistent. The key to a great design is in the details!



↪ RUSTY TICK



ORNITHOPTER ↪

SEE MORE FROM MARK IN YOUR KIT TO DESIGN JOURNAL AT LEGOmba.com!

LEGO® Fan Creations!

A STEAM-POWERED WORLD

Sylvain Amacher is a graphic designer who lives in Switzerland. With a talent for making custom LEGO® models and drawing comics, he's been an accomplished LEGO fan builder since 2009. His favorite subject? **STEAMPUNK MODELS!**

"I LOVE STEAMPUNK FOR ITS TINSEL, RETRO AND CLANKING STYLE. ITS UNIVERSE IS FULL OF CHARM, POETRY AND UTOPIAN FUN, AND IT OFFERS COUNTLESS POSSIBILITIES FOR BOTH CUSTOM LEGO MODELS AND STORIES TO DEVELOP."

- SYLVAIN AMACHER

USE YOUR IMAGINATION

When I start on a new steampunk-styled model, I first think of a function and a general shape. For example, is it going to be an armored mono-wheel, a civilian limo or a public building? When I design the shape, I try to make it a compromise between the Victorian style and as much originality as possible. You have more fun when you create a weird contraption!

THE STEAM-MONORAIL

While war is raging on Mars, life goes on in Her Majesty's Empire back on Earth. Citizens rush to hop onto fast and elegant Urban Steam-Monorails to reach their homes, factories, and aether-ships heading for the distant Red Planet!

THE CHRONOSCAPHE





ALTERNATIVE USES

Kicking off the design of a new custom model with the idea of using a LEGO piece for a different purpose than it was designed for can make for some pretty interesting results.

A MATTER OF COLOR

Color choice is always important when you create a new LEGO model, but it's especially important when you decide to make a steampunk creation. You need to transpose the look of the materials used during the Victorian era, like brass, copper and wood. Pieces with colors like gold, copper, black and brown are perfect. They also fit very well with darker tones like dark red, dark green and dark blue, which can make your creation look even more elegant!

FUNCTIONALITY

If color is important for a steampunk model, then mechanical detail is really vital! Gearing, pistons, boilers and transmission belts are elements that are essential for giving your creation a believable and functional look. I always pay attention to placing those elements logically to create the feeling that the device can actually work.



THE STEAM ROCKET



This model is based on a certain period of science fiction: the bullet-shaped rockets of the 1950s, but transposed to steampunk style with lots of grebbles all over it.



THE GOLIATH

This is the perfect example of an alternative use for LEGO pieces. Flipping segmented tread pieces upside-down turned them into a rigid circle that I was able to fill with the mechanical core of the vehicle.

FINAL TOUCHES

Once your creation is complete, feel free to add some gold trim and other decorations to emphasize its Victorian style!

CHARACTERS

Putting together the right minifigure parts is like casting a movie. The more adapted to the style of your build its characters are, the more they'll make it look credible and real.



PRACTICE MAKES PERFECT

Unless a miracle happens, don't expect to build the perfect steampunk model right away. I often fumble around for a long time and frequently have to dismantle some parts before I'm happy with the final result.



THE STEAMOBILE

This steam-powered car is a good example of building as much originality as possible into an existing design like an automobile.



Great Inventions!

Take a look around you! Many of today's most familiar objects, like cars, lights, and even this LEGO® MBA handbook, are the results of incredible historic inventions. When you design your own LEGO brick inventions, think about how these revolutionary ideas have influenced the modern world – and how your own imaginative creations might transform the world of the future!

THE LIGHT BULB

A light bulb uses electricity to heat a filament wire until it glows brightly. The first incandescent light was invented by Sir Humphry Davy in the early 1800s, but it was the famous inventor and businessman Thomas Edison who received a patent for the modern light bulb in 1880. Today, light bulbs are a major part of daily life and have lit the way for many other important inventions!



THE TELEPHONE

A traditional landline telephone system carries audio signals along a pair of insulated wires. The inventor Alexander Graham Bell was awarded the first patent for an electric telephone in 1876. Since then, telephones have connected people all across the world. Telephones originally had to be attached to a phone line in the wall with a cord, but the new development of mobile phone technology has made it possible to take your telephone wherever you go!

THE INTERNAL COMBUSTION ENGINE

Nicolas-Joseph Cugnot built the first self-propelled mechanical vehicle in 1769: a three-wheeled cart driven by steam. The supremacy of the steam engine began to fade when inventor Étienne Lenoir created the first functioning gas-fired internal combustion engine in 1860. Making use of small explosions of fuel to provide power to moving mechanical parts, the new engine led to the four-stroke gas engine that Karl Benz built into his Benz Patent Motorwagen in 1885, making him the inventor of the gasoline-powered automobile!

THE PRINTING PRESS

Used to create text copies by pressing ink onto paper or cloth, the printing press was first developed by Johannes Gutenberg around 1440. The earliest presses were operated by turning a large handle, which pressed a screw down toward the paper below it, making a copy of whatever was attached to the screw. The printing press allowed books to be mass-produced, helping more and more people around the world learn how to read!



KIT 10 INVENTION DESIGNER ELEMENTS!

 1x 6006402	 5x 4233487	 6x 4535739	 13x 4541506	 1x 4221881	 1x 4211622
 1x 6012833	 1x 4162443	 1x 37628	 1x 421206	 3x 4227776	 2x 421807
 3x 4216652	 4x 306226	 1x 3200126	 1x 421511	 1x 4654580	 1x 421815
 2x 4547489	 2x 614326	 7x 4278359	 5x 4529241	 2x 4650260	 1x 421536
 2x 4597131	 1x 6022160	 2x 4593678	 1x 421637	 2x 4258273	 1x 421639
 1x 4119227	 2x 654126	 2x 73587	 2x 4650645	 2x 421063	 2x 4211063
 5x 614101	 2x 428626	 1x 4538722	 2x 421440	 1x 4227398	 2x 421051
 2x 414438	 2x 4200023	 1x 4109175	 2x 421441	 2x 421051	 1x 4217675
 8x 4113917	 4x 302326	 2x 4153044	 2x 421441	 2x 421441	 2x 421487
 1x 4143409	 7x 371026	 3x 4107081	 2x 421421	 2x 4256229	 1x 4211487
 6x 4161734	 2x 307076	 1x 4652060	 2x 4256229	 1x 4550170	 1x 4514559
 5x 4140562	 1x 366626	 1x 3005741	 2x 4565393	 1x 4550170	 2x 4600501
 2x 4224793	 1x 3005748	 1x 4497952	 4x 421395	 1x 4539481	 1x 4514559
 3x 4142865	 1x 303426	 1x 3005748	 4x 4211395	 1x 4211760	 2x 4600501
 2x 4206482	 1x 4153653	 4x 4588293	 2x 4612621	 1x 4211760	 2x 4612621
 1x 9336	 1x 255526	 1x 4186627	 1x 4211452	 1x 4211450	 2x 4612621
 2x 235726	 1x 4569733	 1x 4186627			 2x 4612621
 8x 407026	 3x 4225201	 2x 4631385			 2x 4631385

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