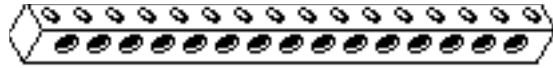


# LEGO Learning Challenge



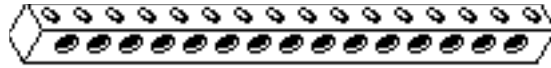
*Design Brief:* Build a vehicle that will climb to the top of the steepest possible incline and then automatically roll down the incline without falling.



*Extreme Challenge:* Design the vehicle to turn before it heads back down the ramp.



# LEGO Learning Challenge



*Design Brief:* In the Fall of 1999, the Coca-Cola company announced that they would be commercially testing a soda machine that would charge thirsty patrons more for a can on a hot day than on a cold day. Build a temperature-sensitive vending machine that charges the user more money based on a hot day.



*Extreme Challenge:* Total the value of coins deposited and store them inside the machine.

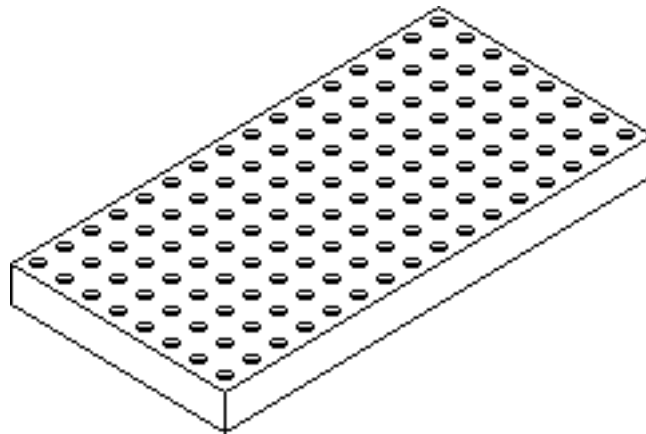


## LEGO Learning Challenge



*Design Brief:* The Denver International Airport spent millions of dollars trying to perfect an automated luggage sorting system for delivering luggage to the proper airplane.

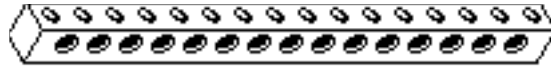
Build a system for delivering luggage, represented by either different color LEGO bricks or by putting barcodes on the side of the bricks, automatically to at least two different planes.



*Extreme Challenge:* Delivering luggage to four, six, eight or 92 different planes is even better!



# LEGO Learning Challenge



*Design Brief:* Build a chairlift, cable car or gondola capable of pulling itself along a string.

Use a second RCX brick as a remote control for navigating the suspended vehicle. (This remains difficult with MicroWorlds EX Robotics)



*Extreme Challenge:* Program the machine to drop a paratrooper when instructed by your homemade remote control.



# LEGO Learning Challenge



*Design Brief:* Build a LEGO creature that follows a flashlight or goes towards the lightest part of a room.

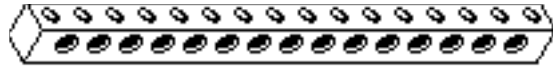
You might try to make another vehicle that runs away from light or one that goes towards a beacon being sent by another yellowbrick (perhaps a game of tag).



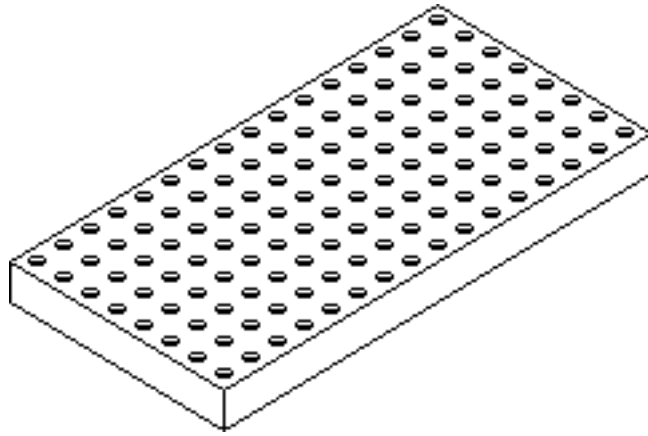
*Extreme Challenge:* Find a way to solve the problem of the robot finding an obstacle between itself and the light-source.



## LEGO Learning Challenge



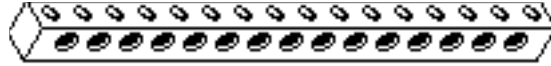
*Design Brief:* Build a robot that can play a xylophone. It should not just bang keys, but also play a repeatable melody.



*Extreme Challenge:* Add additional percussion instruments to your LEGO robot orchestra.



# LEGO Learning Challenge



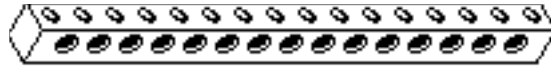
*Design Brief:* Build and program a LEGO athlete to kick, throw or bat an object.



*Extreme Challenge:* Create a robotic defense or score-keeping goal!



# LEGO Learning Challenge



*Design Brief:* Build a machine to play a vinyl record. There should be some sort of comprehensible sound uttered by the machine. A variation could be a machine that simulates playing a CD.



*Extreme Challenge:* You have enough to worry about!





# LEGO Learning Challenge



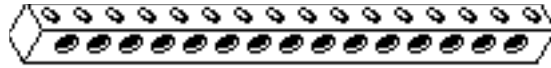
*Design Brief:* Build and program a LEGO fax machine. One part of the machine should scan an image and the other part should reproduce it.



*Extreme Challenge:* You can do it!



# LEGO Learning Challenge



*Design Brief:* Build a birdfeeder that will snap a photo of a bird when it comes to feed.



*Extreme Challenge:* The RCX turns off after five minutes of inactivity. Either you need to figure out a way to keep it active or train the local birds to eat quickly.

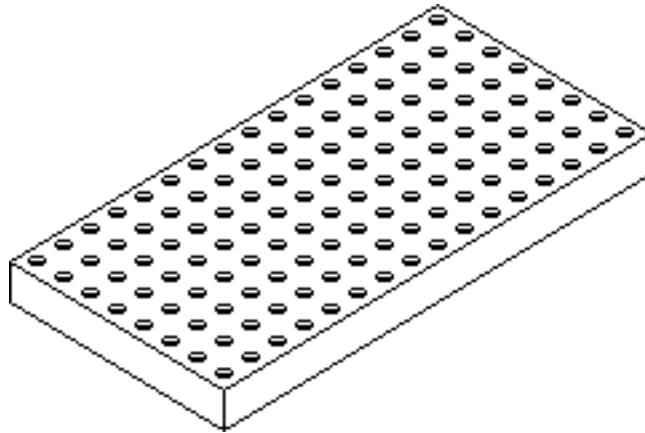
Alert a human after a photo has been taken.



# LEGO Learning Challenge



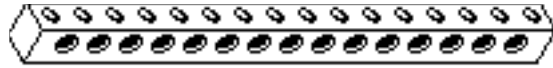
*Design Brief:* Build a machine that will deal a hand of cards.



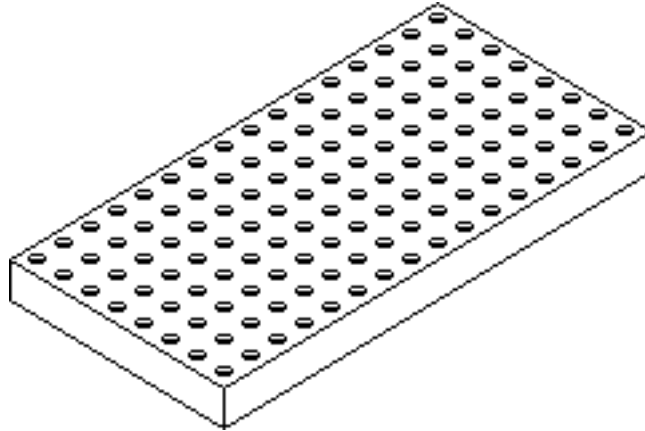
*Extreme Challenge:* Program the machine to play Blackjack or another card game against a human opponent. You may wish to use some sort of code on the back to mark each card.



# LEGO Learning Challenge



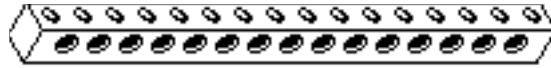
*Design Brief:* Construct a machine that will blow soap bubbles.



*Extreme Challenge:* Can you make the bubble machine mobile?



# LEGO Learning Challenge



*Design Brief:* Invent a machine that can paint a picture.



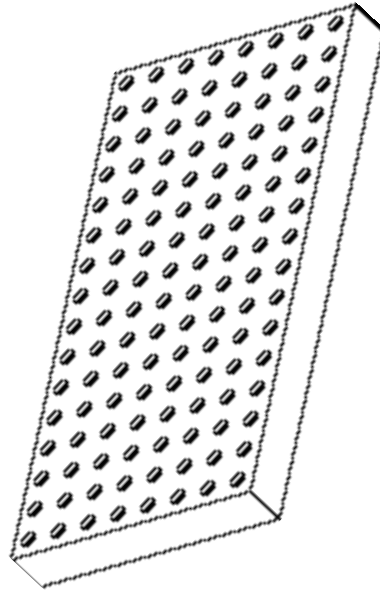
*Extreme Challenge:* Can you make your paintings reproducible? In other words, can the machine make a similar painting over and over again?



# LEGO Learning Challenge



*Design Brief:* Bring a stuffed animal to life with robotic components.



*Extreme Challenge:* Make the creature dance and/or sing.



# LEGO Learning Challenge



*Design Brief:* Build a candy vending machine out of the LEGO materials.



*Extreme Challenge:* Program the machine to dispense a precise quantity of M&Ms or gumballs when a coin is deposited.

