This Constructopedia™ is a building guide for Extreme Creatures™ that offers suggestions, hints, and tips to get you started on the Extreme Creatures™ CD-ROM Challenges and Creatures of your own design.

To master a Challenge, you must follow three basic steps:

1. Construct – To start, review the Design Brief. Then gather the pieces you need to meet the Challenge and start building.

2. Program – Once your robot is built, you can program it using the simple, but powerful, programming language included on the CD-ROM. Your program will determine how your creature reacts to its environment.

3. Test – Now it's time to test your program and design. Once you have downloaded your program from your PC to your RCX™ using the infrared transmitter, your robot can run independent of your computer. Now let it loose and watch what happens!

Skorpion

- Needs 1 motor for both claws
- Has a touch sensor to trigger claw motor
- Needs a 2nd motor for the stinging tail
- Has a 2nd touch sensor to trigger tail motor
CONTENTS

PROJECT IDEAS  4
CREATURE MOVER 1  6
CREATURE MOVER 2  9
CREATURE MOVER 3  12
PINCER  16
CLAW  18
WAGGER  21

SPECIAL FEATURES
  Movement  24
  Sensors  26
  Attachments  27
  Grabber Attachments  28
  Tails  29

TIPS & TRICKS  30
TOP SECRET PLANS  36
PARTS IDENTIFICATION  39

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What follows are basic instructions for building the six subassemblies associated with the Extreme Creatures™ CD-ROM Challenges. The same instructions can be used for building your own Creatures.

**CREATURE MOVER 1**
- Slowly moves back and forth.
- Requires one motor.

**CREATURE MOVER 2**
- Uses gears to slowly turn left and right.
- Requires two motors.

**CREATURE MOVER 3**
- Uses pulleys to slowly turn left and right.
- Requires two motors.
**Pincer**
- Grabbing mechanism opens and closes.
- Requires one motor.

**Claw**
- Grabbing mechanism is activated by a trigger.
- Requires no motor.

**Wagger**
- Tail pieces move quickly from side to side.
- Requires one motor.
Creature Mover 1

To get started on Creature Mover 1, follow these 5 steps.

### BEFORE YOU GET STARTED...
Make sure there are batteries in your RCX. For help installing batteries, turn to page 35.

1. For this step, you need:

- 8-tooth gear
- Motor

4x means you need 4 of these.

Put the 8-tooth gear onto the motor.

2. For this step, you need:

- 2x2 plate
- 1x2 plate

Put the 2x2 plate here.
Put the 1x2 plate here.
For this step, you need:

1 x 2 beam

To measure an axle, see page 34.

Put the 1 x 2 beams here.

For this step, you need:

1 x 2 brick

Bushing
Put a bushing onto the axle.

Put the 1x2 bricks here.
For this step, you need:

Do this first:
Put the 1 x 2 bricks here.

HINT: Try these wheels.

IF YOU NEED HELP COMPLETING YOUR ROBOT...
- Check out “Special Features” on page 24.
- Turn to “Tips and Tricks” on page 30.

TO PROGRAM YOUR CREATURE...
- Go to one of the following challenges on the CD-ROM:
  Trapdragon, Bomberfly, Hammerphist, Stegoclubbber or Tyrannolifter.
To get started on Creature Mover 2, follow these 6 steps.

1. **BEFORE YOU GET STARTED...**
   Make sure there are batteries in your RCX. For help installing batteries, turn to page 35.

   For this step, you need:
   - 4x means you need 4 of these.
   - 2x6 plate with holes

   To measure an axle, see page 34.

2. For this step, you need:
   - 1x2 beam

   Put the 1x2 beams here.
3. For this step, you need:

- 8-tooth gear
- Connector peg with axle

Put the 8-tooth gears here.
Put a connector peg with axle here.

4. For this step, you need:

- Axle extender

Do this first!
Put the axle extenders onto the connector peg with axle.
For this step, you need:

- Motor
- 2x4 brick
- Put an 8-tooth gear onto the motor.
- Put the 2x4 brick here.

For this step, you need:

- Crown gear
- 24-tooth gear
- The gears also go on this side.
- The hint is to try this wheel.

IF YOU NEED HELP COMPLETING YOUR ROBOT...
- Check out "Special Features" on page 24.
- Turn to "Tips and Tricks" on page 30.

TO PROGRAM YOUR CREATURE...
- Go to one of the following challenges on the CD-ROM: Touchmole, Glyptotank or Triceradozer.
- The hint is to try this wheel.
To get started on Creature Mover 3, follow these 6 steps.

BEFORE YOU GET STARTED...
Make sure there are batteries in your RCX. For help installing batteries, turn to page 35.

For this step, you need:

- Long black connector peg
- 8x means you need 8 of these.
- 1 x 16 beam.

Those are the long black connector pegs.

Do this first!
Build this, then attach it to the 1 x 16 beam.
For this step, you need:

To measure an axle, see page 34.

1x2 plate

Put a 1x2 plate here.

For this step, you need:

Large pulley

Put a large pulley onto each axle.
For this step, you need:

1x10 plate

For this step, you need:

Electrical wire

Put the 1x10 plates here.

Put the electrical wire onto the motors.
For this step, you need:

- 1x12 beam
- 2x 1x12 beams

HINT: Try this.

Put the 1x12 beams onto the black connector pegs.

HINT: Try these wheels.

IF YOU NEED HELP COMPLETING YOUR ROBOT...

- Check out “Special Features” on page 24.
- Turn to “Tips and Tricks” on page 30.

TO PROGRAM YOUR CREATURE...

- Go to one of the following challenges on the CD-ROM: Touchmole or Triceradozer.
To get started on the Pincer, follow these 3 steps.

1. **BEFORE YOU GET STARTED...**
   Make sure there are batteries in your RCX. For help installing batteries, turn to page 35.

   For this step, you need:
   - **Motor**
   - **Electrical wire**

   4x means you need 4 of these.

   Push the electrical wire into the grove.

2. **For this step, you need:**
   - **2x6 plate with holes**

   Put the 2x6 plate with holes here.
For this step, you need:

a. Put the 16-tooth gears onto the axles.

b. Put the gray connector pegs here.

To measure an axle, see page 34.

For this step, you need:

c. Build this first, then attach it to the gray connector pegs.

Attach this to the previous step.

4

Pincer

- Use the Pincer on your own creature, or together with Creature Mover 1, 2 or 3.

Hint:

- Try one of the following challenges: Bomberfly, Skorpion or Tyrannolifter.
To get started on the Claw, follow these 6 steps.

BECOME YOU GET STARTED...
Make sure there are batteries in your RCX. For help installing batteries, turn to page 35.

For this step, you need:

1. **1x2 plate**
   - To measure an axle, see page 34.
   - 2x means you need 2 of these.

2. **2x2 round brick**
   - 2x8 plate with holes
   - This is a 2x8 plate with holes
3
For this step, you need:

- Long black connector peg
- Connector peg with axle

Put a long black connector peg here.

4
For this step, you need:

- Axle with stop

Put the connector peg with axles here.
For this step, you need:

1/2 bushing

Put a 1/2 bushing here.

For this step, you need:

Rubber band

Put the rubber band here.

CLAW
- Use the Claw on your own creature, or together with Creature Mover 1, 2 or 3.

HINT:
Try this.
To get started on the Wagger, follow these 5 steps.

BEFORE YOU GET STARTED...
Make sure there are batteries in your RCX. For help installing batteries, turn to page 35.

1. For this step, you need:
   - 2x means you need 2 of these.
   - Black connector peg
   - Put the black connector pegs here.

2. For this step, you need:
   - 1x2 plate
   - Put the 1x2 plates here.
3. For this step, you need:

- 1x10 beam

4. For this step, you need:

- 2x2 round brick

   To measure an axle, see page 34.

   Attach the 1x10 beams to the black connector pegs.

   Put the 2x2 round brick here.
For this step, you need:

- Half beam

Put the half beam here.

**WAGGER**
- Use the Wagger on your own creature, or together with Creature Mover 1, 2 or 3.

**HINT**
- Try one of the following challenges: Pitcher Critter, Skorpion, Hammerphist or Stegoclubber.
There's more than one way to get things moving. Here are a few ideas to get your mind in gear.

1. To make your creature limp, attach a foot to the wheel.
2. To make your creature hop, use these lopsided feet.
3. You can use more than one-sized wheel to make your creature move. Try this combination.
4. Now try this one.
Use this tread to make your creature move.

You can also use a triangular tread.

This chassis wobbles as it moves.

This chassis lunges as it moves.
Sensors make it possible for your creature to respond to its environment. Here are a few ideas on how to use light sensors and touch sensors.

**Touch Sensors**

1. Use a bumper to activate your touch sensors. For help, turn to Tips & Tricks on page 32.

2. Use antennae to activate your touch sensors.

**Light Sensors**

3. Try a light sensor facing down.

4. Try a light sensor facing up.

5. Use feelers to activate your touch sensors. For help, turn to Tips & Tricks on page 32.
Attachments

These can be used as antennae.

This can also be used as an antennae.

See what your creature looks like with big eyes like these.

Try making both one-eyed and two-eyed creatures.

Try these wings on your creature.

These can also be used as wings.
Special Features

GRABBER ATTACHMENTS

Attachments for the pincer

1. Add teeth to make a jaw.

Attachments for the claw

2. Add these pieces to make a claw.

3. This is a hand that grasps when triggered.

4. This is another trigger-activated hand.
Tails

Here are some ideas of tails to build.

Here is a long tail.

Try this on the Stego clubber.

Try this on the Skorpion.
If you want to make your invention bigger, stronger, faster, or work even better, try using these tips and tricks.

Adding length

Attaching a tube

Adding pieces to a rim

Attaching a tube

Making angles

Use the short gray connector peg to attach the yellow tube to a brick.

Attaching a pulley wheel

Making angles

Use the angle pieces to make the motor point up.
Making a hinge

Adding pieces to a tube

Using a turntable

10

Making a crank shaft

12

Use these pieces to make a “hump” in the axle.

Adding bricks to a beam

Adding hubs for caterpillar treads

14

Use gears to attach the wheels for the track.

Adding a lift arm to a beam

15
Tips & Tricks

Attaching a wing

Adding eyes

Adding eyes

Making a single bumper

Making a double bumper
Using gears to turn corners

This is how you can get an axle to spin at a right angle to another.

Linking gears

Connecting the gears this way links one axle to another.

Linking gears

These gears will spin in opposite directions.

Using the 24-tooth crown gear

Changing speeds using different-sized pulley wheels

Right angle gears
Tips & Tricks

Changing speeds using different-sized gears

Using one motor to drive two axles

Using different-sized pulley wheels

Covering the wire

How to Measure an Axle
Use this chart to measure the length of an axle.
Battery Installation for the RCX

1. Remove the bottom of the RCX.
2. Insert 6 AA (LR6) batteries.
3. Put the bottom back on the RCX.

Instructions for use of battery box:
Never mix different types of batteries or old and new batteries in one battery box. Always replace the batteries from the battery box for long-term storage and never touch the end of the battery pack. Battery boxes can be used for batteries. Used batteries should be replaced with new ones. Keep batteries away from pets. Rechargeable batteries are only to be charged under adult supervision.

Battery Installation for the Infrared Transmitter

1. Slide the cover back.
2. Insert the 9V battery.
3. Close the cover.
Fiber Optics

Use fiber optic strands to create creatures with flashing lights.

How fiber optics work.
Fiber optics are thin transparent plastic fibers that transmit light throughout their length.

Light unit
The light unit has one "light bulb" and must be rotated to get light into all the different fiber optics.

Put the fiber optics into the light unit.

Use the gray half-connector peg to hold the fiber optics in place.

Attach the fiber optics unit to the motor.

Use a motor to power the wheels and the fiber optics.
Attach the fiber optic light unit to a motor. Then attach the motor to RCX, port A. Turn on the RCX and press run, watch the lights turn on.

Here's one example of how to use the set's fiber optic strands. Now let's see what you can create.

Using hinges for action

A catapult

The jaws of the Trapdragon.
Top Secret Plans

Testing a Stegoclubber

Testing a Triceradozer