

BECOME AN EARTH DOCTOR GAME

**Created by the Land Reclamation
International Graduate School**

Rules of the Game

1. The goal of this game is successfully reclaim a site on time and on budget, while keeping people happy.
2. Supplies needed
 - a dice
 - a number generator (<https://www.random.org/>) – if you don't have a dice, use the random number generator to replace it
 - 6 items you like (anything you want) for each player/team
3. To start the game, first decide - are you playing alone, competing with someone else or on a team?
4. Start with 3 of the 6 things that make you happy. You need to have at least 1 left by the end of the game, but you can also earn more. As you go through each step, you may pick an option that makes stakeholders (people who are involved in your project) angry – if you make them angry, you have to give up something that makes you happy. However if you select an option that makes them happy, you can take another thing that makes you happy. If you select a moderate option, nothing changes.
 - If you have to play multiple rounds in a step because your method wasn't successful, you may lose or gain multiple items.
5. Complete each step of reclamation.

Score Sheet

Count down your points through each step.

Step	Time Points	Cost Points
Starting point (record your points based on the end land use you picked)		
Remediation		
Soil Reclamation		
Revegetation		
Risk Card 1		
Risk Card 2		
Risk Card 3		

STEP 1: SELECT AN END LAND USE.

Consider your budget and time line.
You need to meet the time and cost
points.



130 time
50 cost

This end land use is cheap, but it takes a long time! To carry out your reclamation project, you only have 50 cost points but you *do* have 130 time points!

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50 time
130 cost

This end land use is very costly, but it doesn't take much time! To carry out your reclamation project, you only have 50 time points but you *do* have 130 cost points!

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90 time
90 cost

This end land use could be a safe bet or it could be too limiting. To carry out your reclamation project, you have 90 time points and 90 cost points.

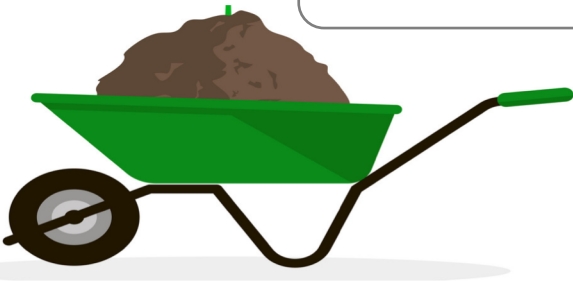
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STEP 2: SELECT YOUR REMEDIATION TECHNIQUE.

Consider your budget and time line, as well as the likelihood of success. Once you select, roll the dice/number generator (set to a number between 1 and 6). If successful, go to the next step. If not, you can try again or select a different method.

Consider if stakeholders are happy (get something that makes you happy), angry (lose something) or moderate (nothing happens).

Remediation



Biopiling

Description: Soils are excavated from a contaminated site, and piled in a treatment site where it is monitored for improvement.

Cost: 15 cost points

Speed: 15 time points

Effectiveness: Roll dice. 1-3 = fail, 4-6 = success

Stakeholder Opinion: Happy

Remediation



Natural Attenuation

Description: Soils are decontaminated over time mainly by natural occurring microorganisms.

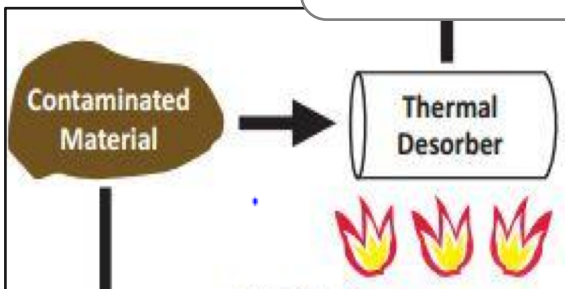
Cost: 5 cost points

Speed: 25 time points

Effectiveness: Roll dice. 1-4 = fail, 5-6 = success

Stakeholder Opinion: Moderate

Remediation



Thermal Desorption

Description: Soil is heated (over 150 °C) to remove volatile contaminants.

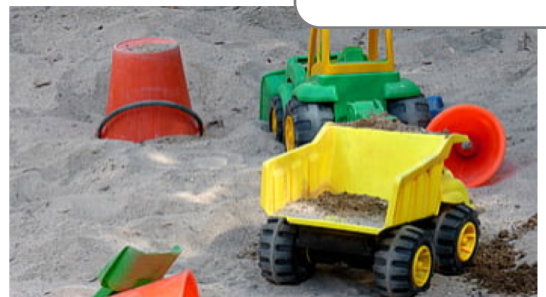
Cost: 25 cost points

Speed: 10 time points

Effectiveness: Roll dice. 1 = fail, 2-6 = success

Stakeholder Opinion: Happy

Remediation



Dig and Dump

Description: Soils are excavated from a contaminated site and dumped in another site

Cost: 30 cost points

Speed: 5 time points

Effectiveness: Roll dice. 1 = fail, 2-6 = success

Stakeholder Opinion: Angry

STEP 3: SELECT YOUR AMENDMENT FOR SOIL RECLAMATION.

Consider your budget and time line, as well as the likelihood of success. Once you select, roll the dice/number generator (set to a number between 1 and 6). If successful, go to the next step. If not, you can try again or select a different method.

Consider if stakeholders are happy (get something that makes you happy), angry (lose something) or moderate (nothing happens).

Soil Reclamation



Manure

Description: Animal waste applied to soil to increase nutrients, carbon and water holding capacity.

Cost: 10 cost points

Speed: 15 time points

Effectiveness: Roll dice. 1-3 = fail, 4-6 = success

Stakeholder Opinion: Moderate

Contaminants: Use 5 additional cost points for lab tests. Can only applied if deemed safe which in this case it is.

Soil Reclamation



Peat

Description: Salvaged wetland material mixed with mineral soil to add organic carbon and improve water holding capacity.

Cost: 25 cost points

Speed: 20 time points

Effectiveness: Roll dice. 1-3 = fail, 4-6 = success

Stakeholder Opinion: Happy

Contaminants: None

Soil Reclamation



Nothing

Description: No amendments applied.

Cost: 0 cost points

Speed: 40 time points

Effectiveness: Roll dice. 1-5 = fail, 6 = success

Stakeholder Opinion: Angry

Contaminants: None

Soil Reclamation



Fertilizer

Description: Inorganic nitrogen, phosphorus and potassium added as nutrients to soil.

Cost: 35 cost points

Speed: 10 time points

Effectiveness: Roll dice. 1-2 = fail, 3-6 = success

Stakeholder Opinion: Moderate

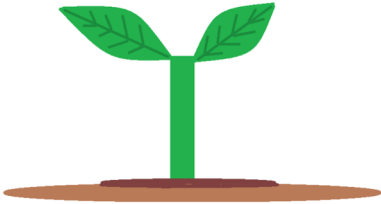
Contaminants: None

STEP 4: SELECT YOUR REVEGETATION METHOD.

Consider your budget and time line, as well as the likelihood of success. Once you select, roll the dice/number generator (set to a number between 1 and 6). If successful, go to the next step. If not, you can try again or select a different method.

Consider if stakeholders are happy (get something that makes you happy), angry (lose something) or moderate (nothing happens).

Revegetation



Native Plants

Description: Native plants are selected and planted onto the reclamation site

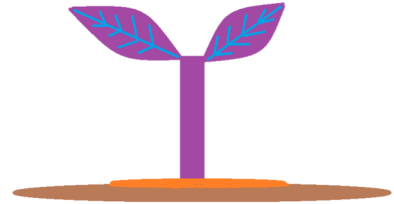
Cost: 35 cost points

Speed: 20 time points

Effectiveness: Roll dice. 1 = fail, 2-6 = success

Stakeholder Opinion: Happy

Revegetation



Non-native plants

Description: Non-native plants are selected and planted onto the reclamation site

Cost: 15 cost points

Speed: 10 time points

Effectiveness: Roll dice. 1-3 = fail, 4-6 = success

Stakeholder Opinion: Moderate

Revegetation



Mixed Planting

Description: A combination of native and non-native plants are planted on the reclamation site

Cost: 25 cost points

Speed: 15 time points

Effectiveness: Roll dice. 1-3= fail, 4-6 = success

Stakeholder Opinion: Moderate

Revegetation



Nothing!

Description: Nothing is planted.

Cost: 0 points

Speed: 35 time points

Effectiveness: Roll dice. 1-5 = fail, 6 = success

Stakeholder Opinion: Angry

STEP 5: TIME TO RISK IT ALL.

Many factors can negatively or positively affect your reclamation. Use your number generator to select three numbers between 1 and 24. Once you have all three numbers, find the corresponding card and add or subtract those points.

1



A heavy rainstorm washes out your site and removes all your plants. Remove the cost and time of revegetation to your score.

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2



People were skiing on avalanche terrain and caused an avalanche that damaged the road that leads to your site. Remove 5 cost and 5 time scores.

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3



Research is awesome! Some researchers find an all-in-one amendment that reduces your costs. Add 5 cost scores.

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4



Technology advances so fast! A new machine was invented and they want to try it on your site for free. Add 5 cost scores.

5



An invasive species establishes on your site. Remove 10 cost and 5 time points to address them with pesticides and manual removal.

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6



Your equipment breaks down. Remove 5 time and 5 cost points.

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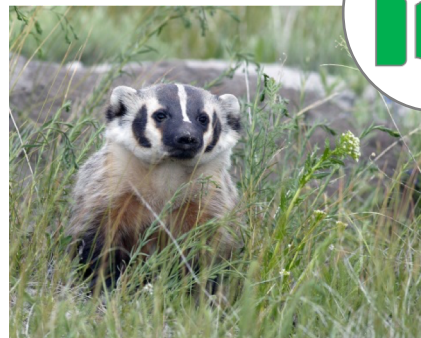
7



A community group gets involved in your reclamation plan and helps with replanting. Add 5 time and 5 cost points.

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8



Wonderful news! A female American Badger, which is an endangered species, settles on your site with its 4 babies. Add 10 time and 10 cost points.

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9



During monitoring, you sneeze and spill diesel while refilling your truck. Remove half of your total remediation cost and time points.

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10



Teenagers keep accessing the reclamation site at night. Remove 5 cost points for fencing and security.

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11



A millionaire loves nature and donated lots of money to your project. Add 10 cost points.

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12



Access to your site improves, add 5 time and 5 cost points.

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13



A summer tornado reaches your site, removing all your vegetation. Remove the cost and time of revegetation to your score.

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14



A wildfire reaches your site, burning all your vegetation. Some reestablishes from the seedbank left behind. Remove half the cost and time of revegetation to your score to address the remaining missing plants.

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15



Excellent growing conditions reduced the time for vegetation to meet your goals. Add 10 time and cost points.

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16



Monitoring finds a target species. Well done! Add 10 cost points.

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17



An unusual drought caused by the changing climate kills half of your vegetation. Remove half the cost of revegetation and 5 time points.

18



The melting of snow from the mountains causes a landslide that reaches your site, washing away your vegetation and part of the topsoil. Remove half the cost and time of your revegetation and soil reclamation to your score.

19



Soil condition was better than expected requiring less amendments, add 5 cost points.

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20



You managed to do a community partnered monitoring program that involves the community and reduce costs. Add 10 cost points.

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21



Wild life eats some of your vegetation. Remove 5 time and 5 cost points.

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22



Too bad! The tree planters you hired were freshmen and many of your plants die a year after planting. Remove half the time and cost points of revegetation.

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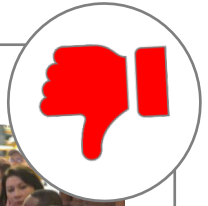
23



A bear has found home in your site and you cannot do your planned monitoring. Remove 10 time points.

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24



Your public consultation period wasn't long enough. Indigenous communities are worried about the remediation project. Remove 10 time points.

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STEP 6: THE END. WERE YOU SUCCESSFUL?

Time to assess your final cost and time points. Did you reclaim your landscape under budget and on time? Do you have any items left that make you happy?

If you were under budget, on time and still happy, you were successful!! If not, try again.