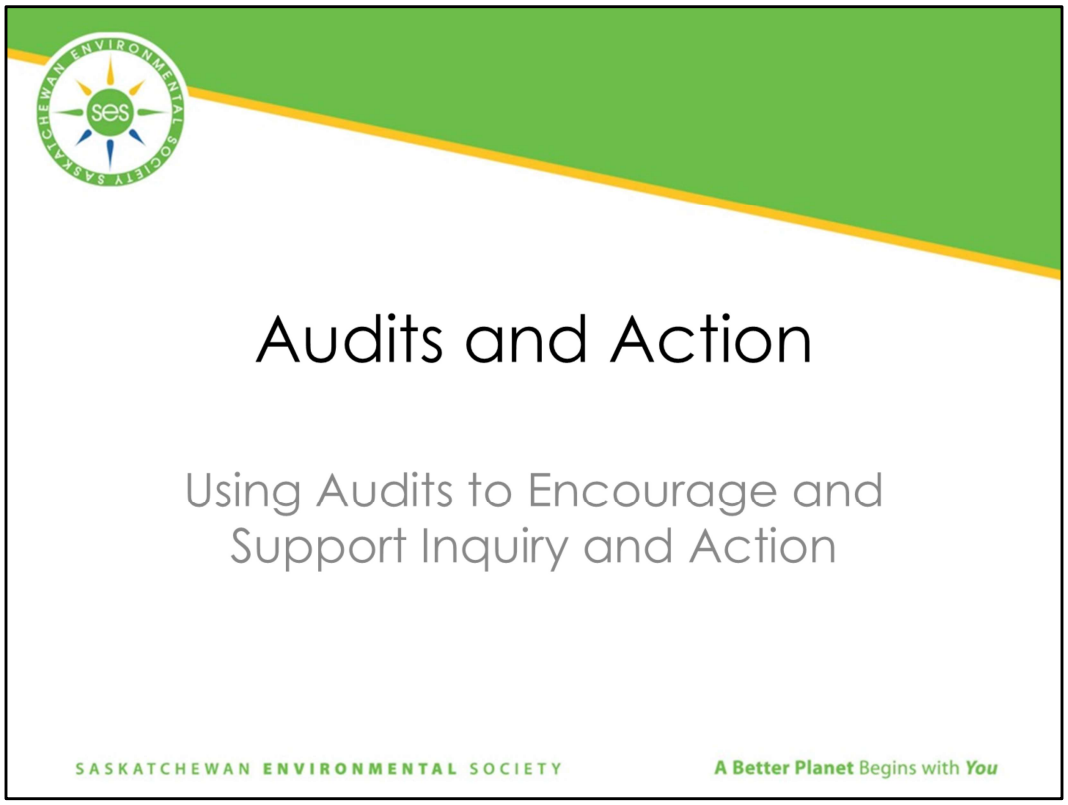
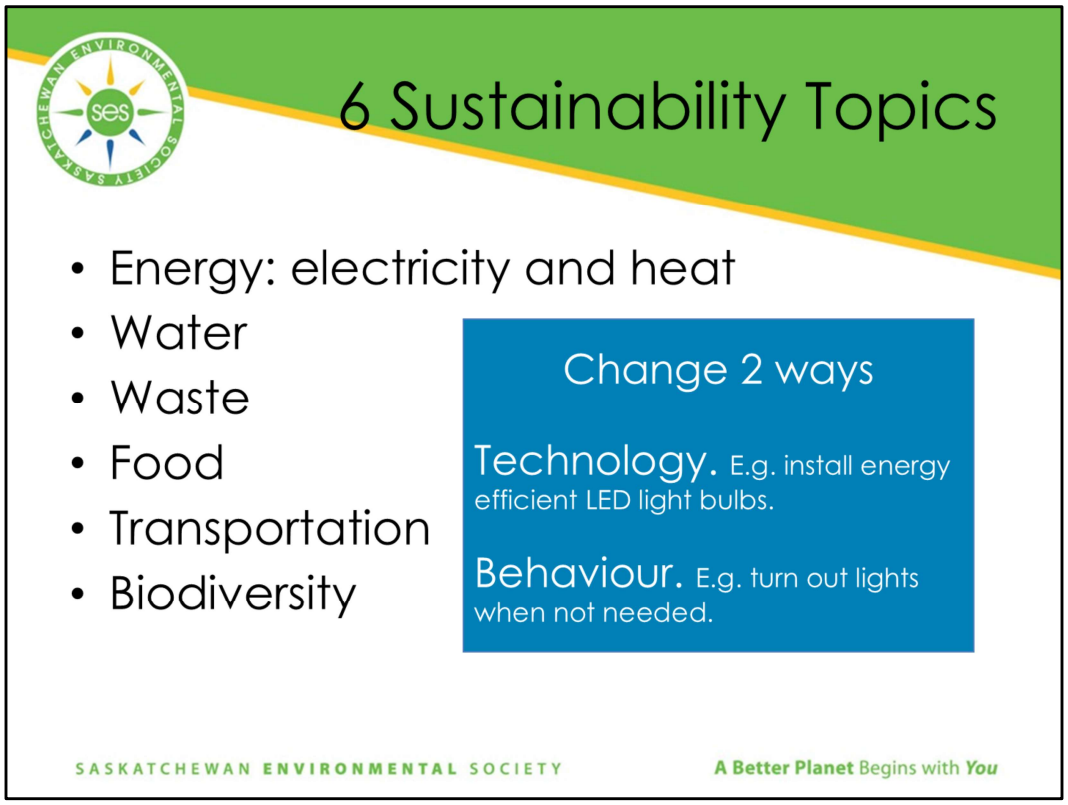


One part of SASF is that, once all the projects are done, we report to the City what the GHG emission savings are. Part of what we use the audit process for is to calculate those numbers.

Also, the audit process helps students quantify their successes

This presentation describes how to use audits and the information they provide.

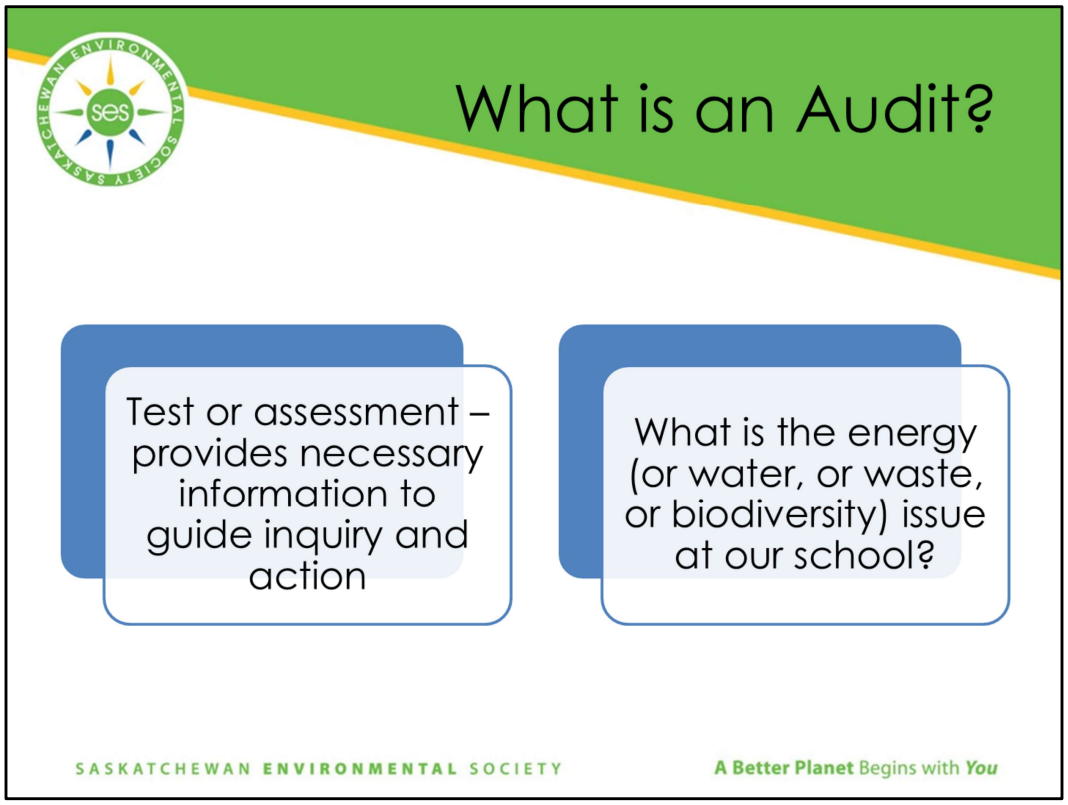
SES will support you in identifying audits that support student action projects and will help with calculating results.



We have 6 different topic areas for SASF. In each of these, we can make changes through technology changes or behaviour changes.

For example, a technology change we can make around lighting is to upgrade to LEDs. A behaviour change is to turn the lights off when they aren't needed.

Whatever our projects, we need to learn what to change, how to make the changes, and to carry through with the actions we identify.

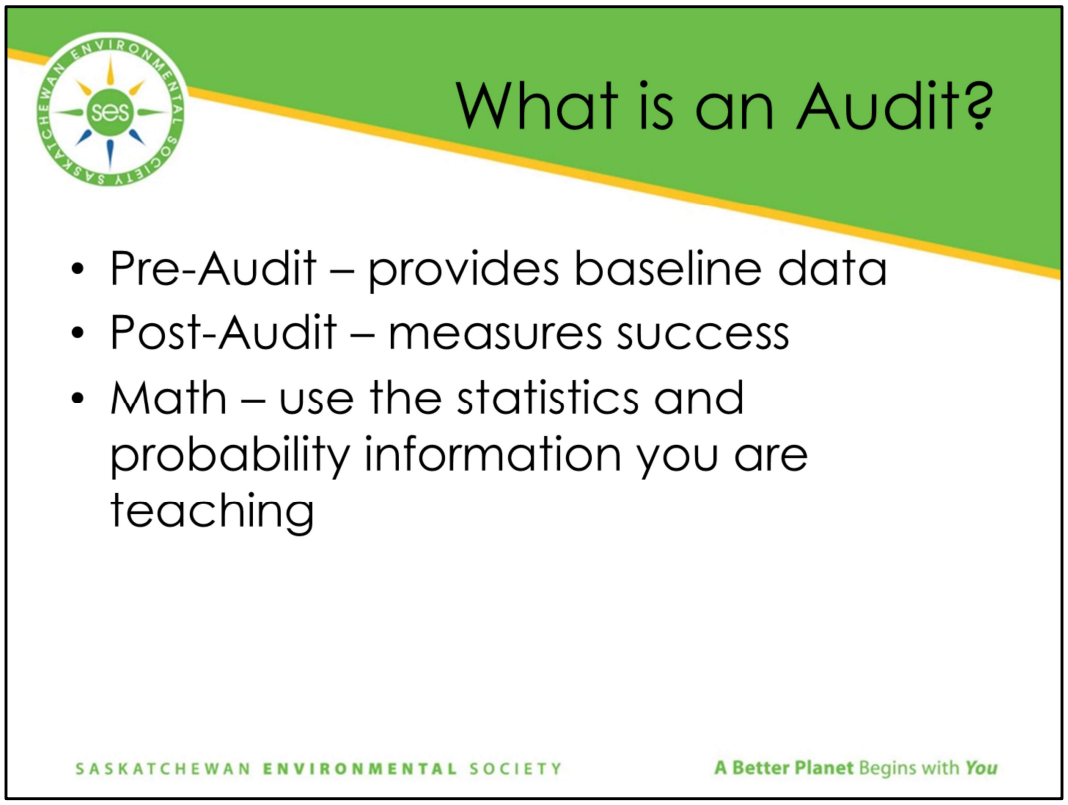


For SASF, we are being paid to help you.

We will work with you to develop the audits you need. We actually have many audits on our website, and others that Amber can send you. If we don't, we'll make one up or help you and your students make one. We DO ask that if you/students are making up an audit you show it to us before you use it. We can often help find some little thing that will make the difference between being able to calculate results, and not.

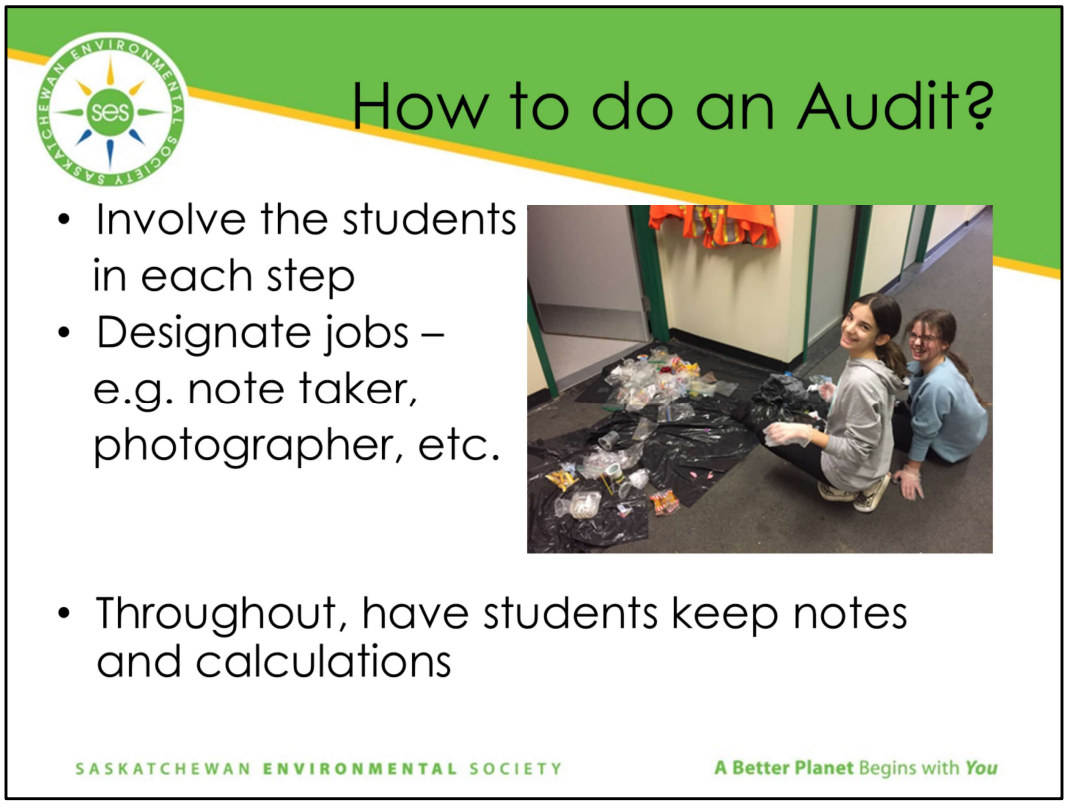
An audit is just a test, or assessment. The concept is like giving a math test where the results give you information about how well your students understand the concepts. If lots of them get #4 wrong, you might say, I need to go back and reteach that concept. An audit works the same way by giving you specific information about what is working well, and what isn't.

Before students take action, they will audit the situation to give them information about what is happening now. Say students decide that they want to conserve water by taking shorter showers. They could design an audit to keep track of how often and how long showers are, for each person in their house. Maybe they will find that their mom takes short showers already, but everyone else takes long, frequent showers. That information becomes the basis for the campaign you will run and which behaviours you will target.



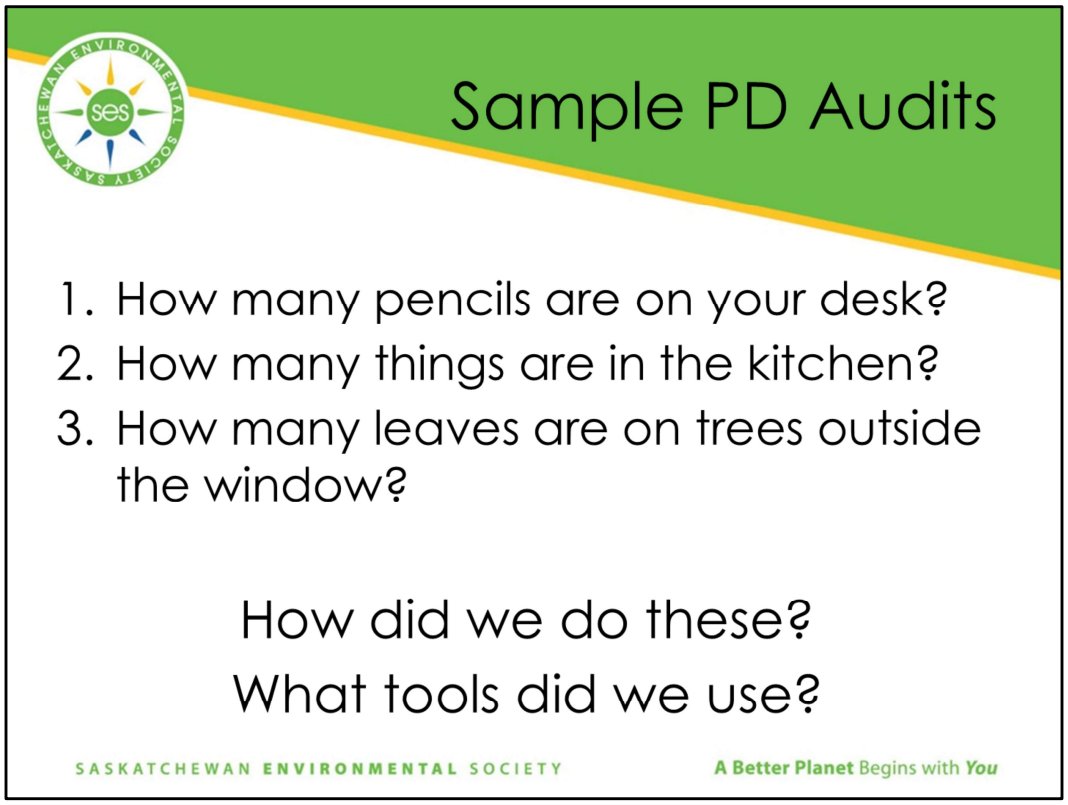
Again, we will help you to find or develop the audit you need. Students will need to do both a pre and post audit, so that we can calculate changes made by their action projects. There will be many ways things change, but the main indicator we use is the greenhouse gas emissions reductions.

- The pre-audit gives you some information to help you choose what you want to focus on. And might help you set a goal – eg reduce waste from 15 kgs/day to 5 kgs/day, or reduce vehicle idling in front of the school by 60%. It can also tell you what NOT to work on. Maybe the students think that lights are on all the time and you need to do a lights out campaign. The audit might tell you that most spaces are doing well, but one particular classroom has an issue.
- The post-audit allows students to see success or provides information to make changes for more success.
- Also, the results of student audits have great learning connections to math, and English language arts.
- Depending on your students, and your learning goals, audits can be more or less detailed, and more or less “mathy”.



Each audit is different. But there are some general things that will help students get involved in the process.

- Be prepared with the charts and materials you need – eg. Print charts, or buy gloves, or borrow energy monitors
- Briefly outline what students will be doing, and designate lots of jobs – note takers, photographers, action idea list makers, kids who can do the math, check other places in the school, speak to the caretaker, clean up crew. Each audit typically has lots of places where students can use and develop a variety of skills.
- have students hang on to any notes or calculations that come out of the audit – they will be useful for planning action, doing other math, and creating presentations. At the end of the project, they can be very helpful when SES is calculating results
- PLEASE put student names and dates on all notes. Quite often I've been working with a group of students, and they don't know what they did when, or even if a particular sheet of notes is theirs.



Let's do some quick audits right now. We'll take 10 minutes to do this. Divide into 3 groups. For our purposes right now, the answer to the question is less important than how you figure it out, or what problems could happen.

Get into groups

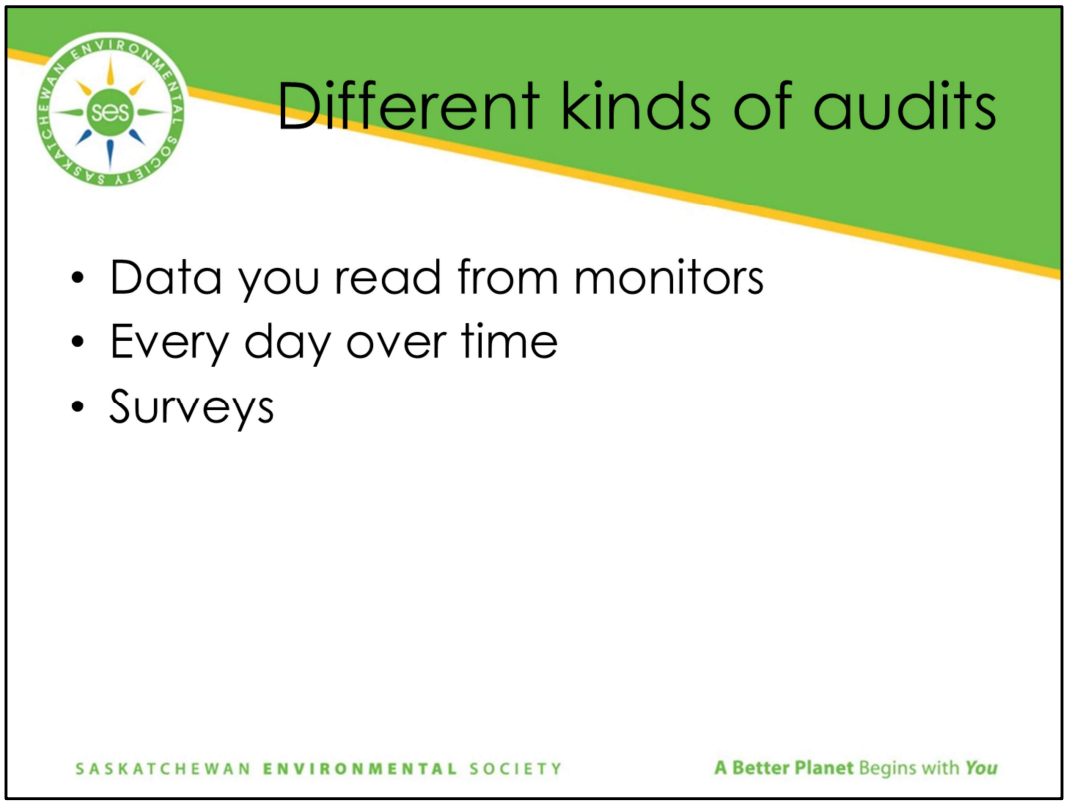
Some audits are simple. To figure out how many pencils are on my desk I simply have to count it.
Some take a bit more thinking. "what does she mean by things", then the counting is reasonably straight forward.
There are still lots of leaves on the trees outside my window, so counting wouldn't be practical. I would need to do lots of estimating and extrapolating.
One year we asked if the tires on the vehicles in the parking lot were properly inflated.
You'd need a few things for that:

- You'd need a tire gauge,
- You'd need to know, front and back, what the appropriate tire pressure was.
- Then you'd have to check the pressure of each tire.
- I.e., you'd need tools and references.

Other audits need tools – such as a scale, stopwatch, or energy meter
Or we may need to survey people – such as if we want to know how people are getting to school

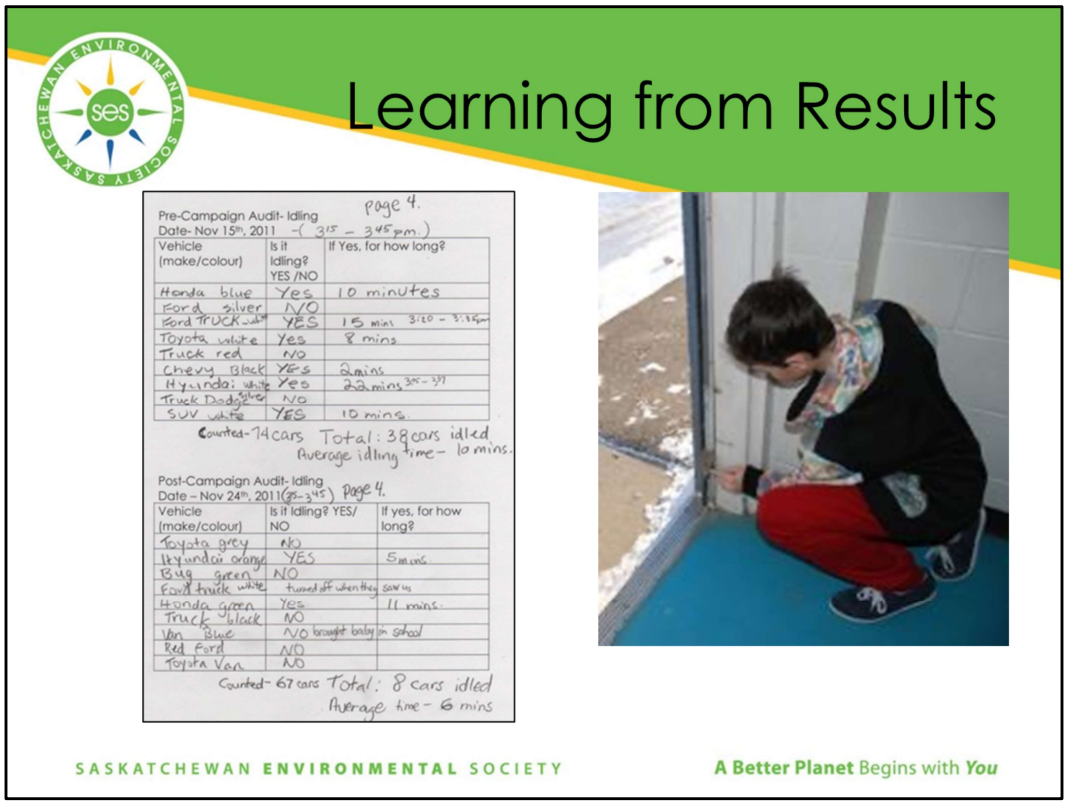
Some things to watch out for are:

1. It can be easy to get bogged down in detail
2. Some students (and teachers) would much rather debate the issue than measure it (or solve it)
3. Remember to write things down in a way that they will make sense later – to you and to me
4. Does your audit require people to disclose socio economic issues. Be careful asking people about possessions or travel, for example.



There are different kids of audits.
For some audits we will physically measure something from some kind of monitor – a watt meter, a scale, other data loggers, etc.
Some audits will be one time measurements, and others will be measurements we do daily over a week, for example
Some will be surveys where we will ask people how they get to school, or what they eat.

Be VERY careful with surveys. If you are using a survey, ask people "what did you do TODAY". You can ask what someone did yesterday, but further back the answers get very unreliable. For example, if you ask me how I get to work, I'll say that I walk or bike. Well, today I drove, because were are out here. Other days I'll drive because I have to get somewhere quickly straight from work. I do this stuff for a living, and I don't think I could give you a good answer on HOW OFTEN I drive to work.
If you are going to use surveys in your AUDITS PLEASE have us review your survey questions to help you get good answers. As humans, we tend to think we're better at things than we are.
For example, for their pre-audit, one class surveyed people saying "how do you normally get to school". Then for their post audit, they asked "how did you get to school today". Their overall results were terrible, and I don't think it was because people didn't improve for their audit. I think they just were wrong about what was normal.



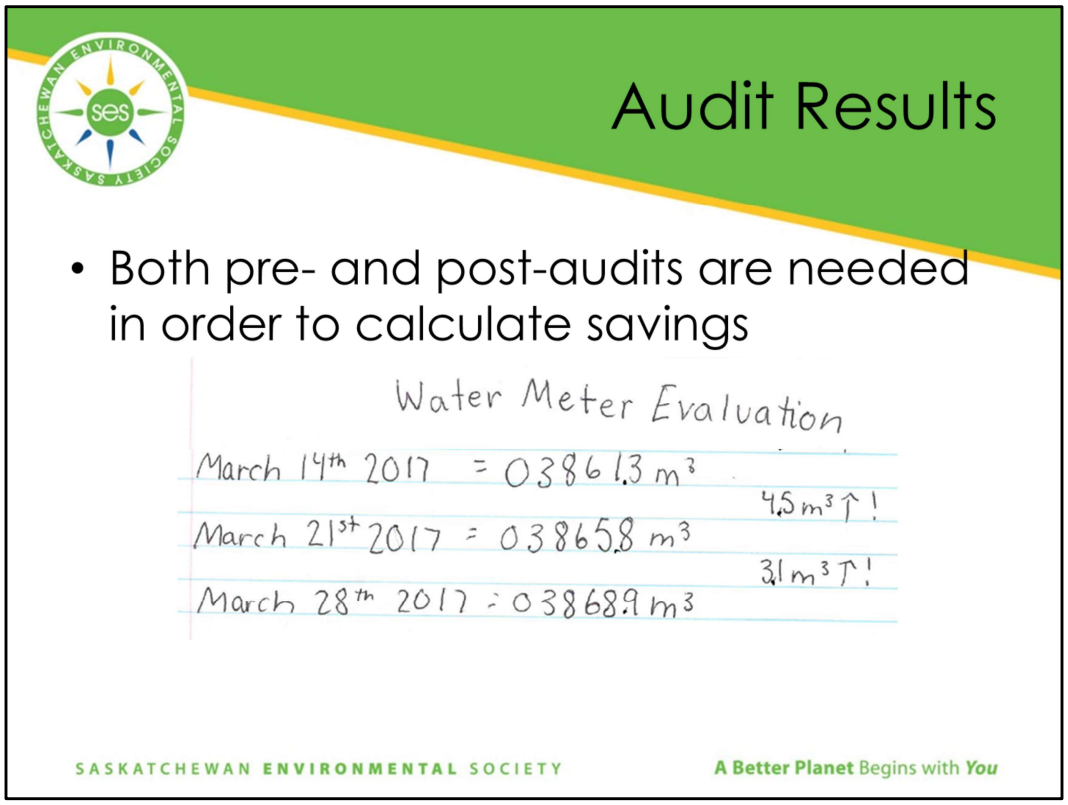
Once students have done a pre-audit, the information should be used to guide their action plan.
The student in the photo is checking weathering stripping on a door. Their group would mark the damage on a chart, and later, would share the information with the caretaker. Then a plan could be made to replace the weatherstripping. The post audit would show where changes were made and estimates of heat loss reduction could be made. Note that savings from heat loss projects are hard to estimate.

The pre-audit information from an idling project shows that about half of the cars counted were idling. Students found that the average idling time was 10 minutes
After they did their campaign their post audit showed a significant reduction in the number of cars that were idling, as well as reduced idling time for each vehicle.

Both examples provide lots of math connections over many grades. Use the graphing and outcomes you are teaching. Fractions, percentages, circle graphs, averages, stacked bar graphs – whatever you are teaching, use this data for it.

The point of SASF isn't math. It provides lots of practical ways to use math, but it shouldn't be the make or break of your program. When you have a pile of data and don't know what to do with it, have Mark or I come and sit with you or your students to figure it out. Or, send us the data and we'll figure it out.

Have SES provide additional support for calculations that may not fit your teaching goals.

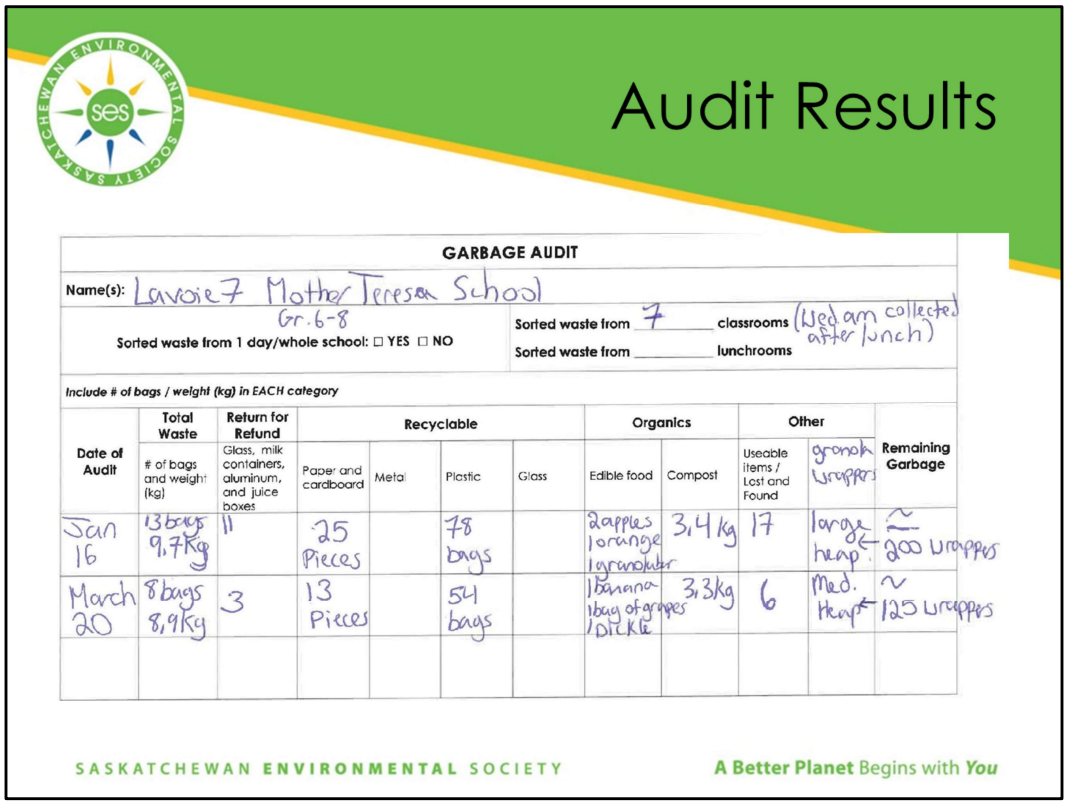


One thing that happens often is that students start a project without measuring their starting point. They'll start getting people to turn off lights, before they've audited how often lights are getting left on. Or they will do a pre-audit, and a good campaign, but not finish it off with a post audit. In those cases, we can't measure savings because we're missing either the pre- or post-audit

Each audit tells us what is happening in that time period. When we have two audits we can see the change between them.

When reading meters, you need to read them twice for each audit.
In the example shown, the student read the meter 3 times and got 2 audit results.

If you want a couple weeks between the pre-and post-audits, just be sure to read the meters at the beginning and end of each week.



Audit Results

GARBAGE AUDIT

Name(s): Lavoie 7 Mother Teresa School Gr. 6-8

Sorted waste from 1 day/whole school: ☐ YES ☐ NO

Sorted waste from 7 classrooms (Wed am collected after lunch)

Sorted waste from _____ lunchrooms

Include # of bags / weight (kg) in EACH category

Date of Audit	Total Waste	Return for Refund	Recyclable				Organics		Other		Remaining Garbage
	# of bags and weight (kg)	Glass, milk containers, aluminum, and juice boxes	Paper and cardboard	Metal	Plastic	Glass	Edible food	Compost	Useable items / Lost and Found	granola wrappers	
Jan 16	13 bags 9,7Kg	11	25 Pieces		78 bags		2 apples 1 orange 1 granola bar	3,4 kg	17	large heap	~ 200 wrappers
March 20	8 bags 8,9Kg	3	13 Pieces		54 bags		1 banana 1 bag of grapes 1 pickle	3,3kg	6	Med. Heap	~ 125 wrappers

SASKATCHEWAN ENVIRONMENTAL SOCIETY

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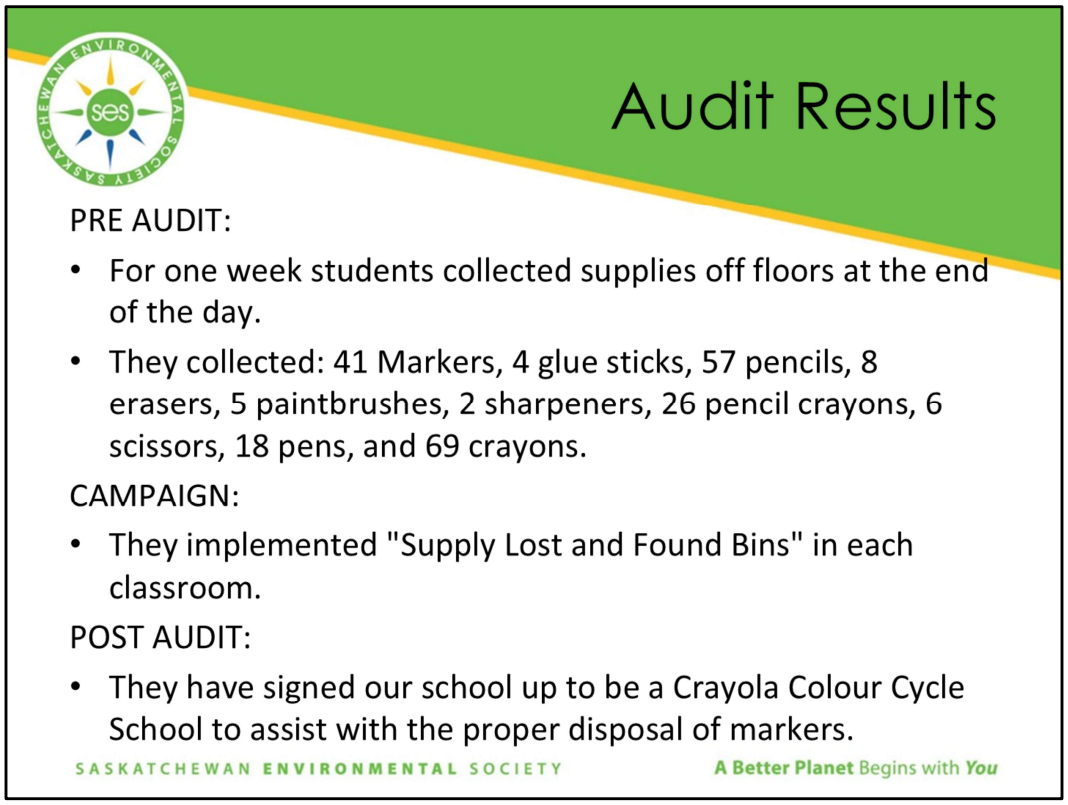
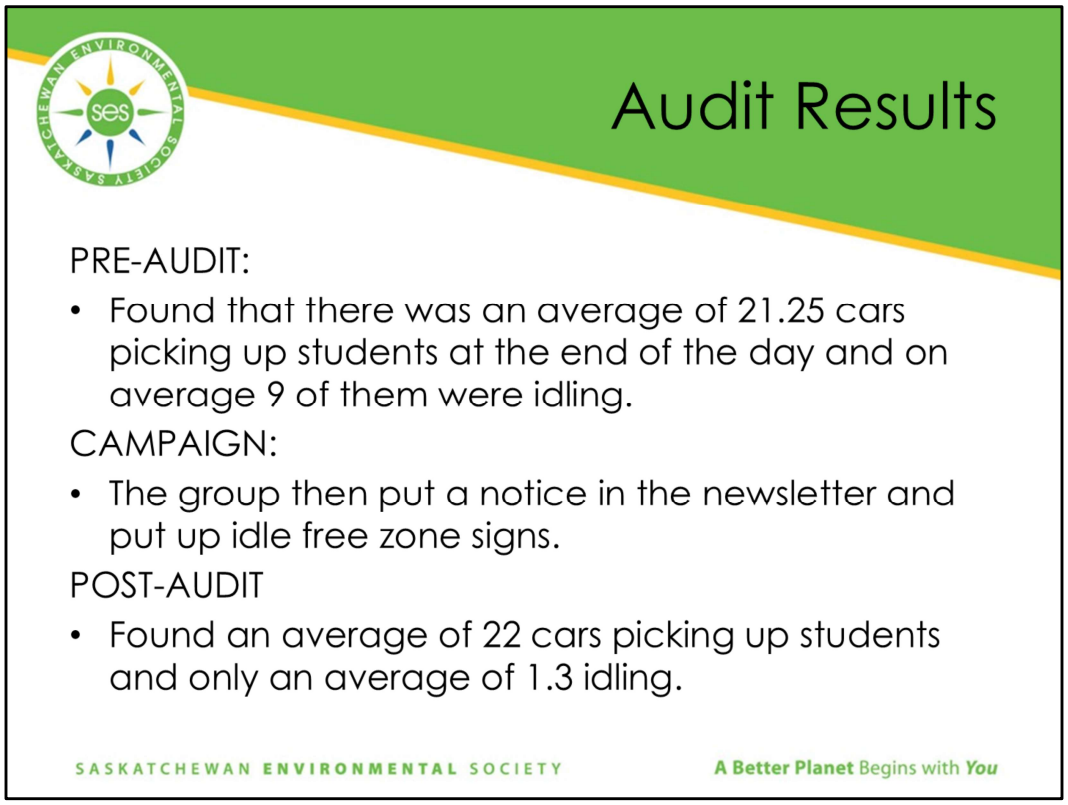
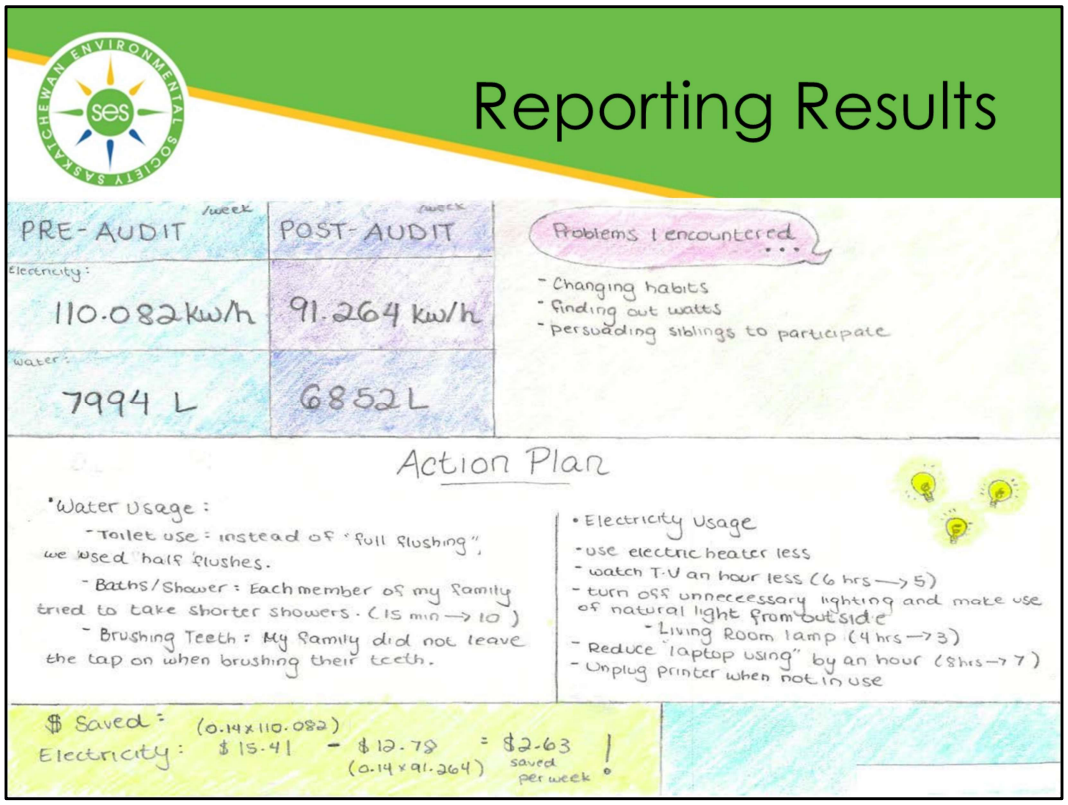
This is excellent. They have the weight of garbage in the pre-and post audits, so we can subtract those to find the difference in mass and calculate GHG reduction. Then in each row they have specifics about how many containers, pieces of paper, etc. This is more understandable for the students than mass. If they had used mass, SES could do a more detailed GHG calculation, but the information would not be as good for story telling.



In this instance the students did a great project. They collected 236 items for re-use, as part of their pre-audit. And they signed the school up for a marker recycling program. However, there was no post audit. We don't know if students starting picking up their things from the floor and re-using them. Or if old markers were actually making it into the marker recycling bin.



These students did a good job of counting the cars, and clearly had significant results. If they had also measured how long each car idled for, we could have calculated GHG reduction.



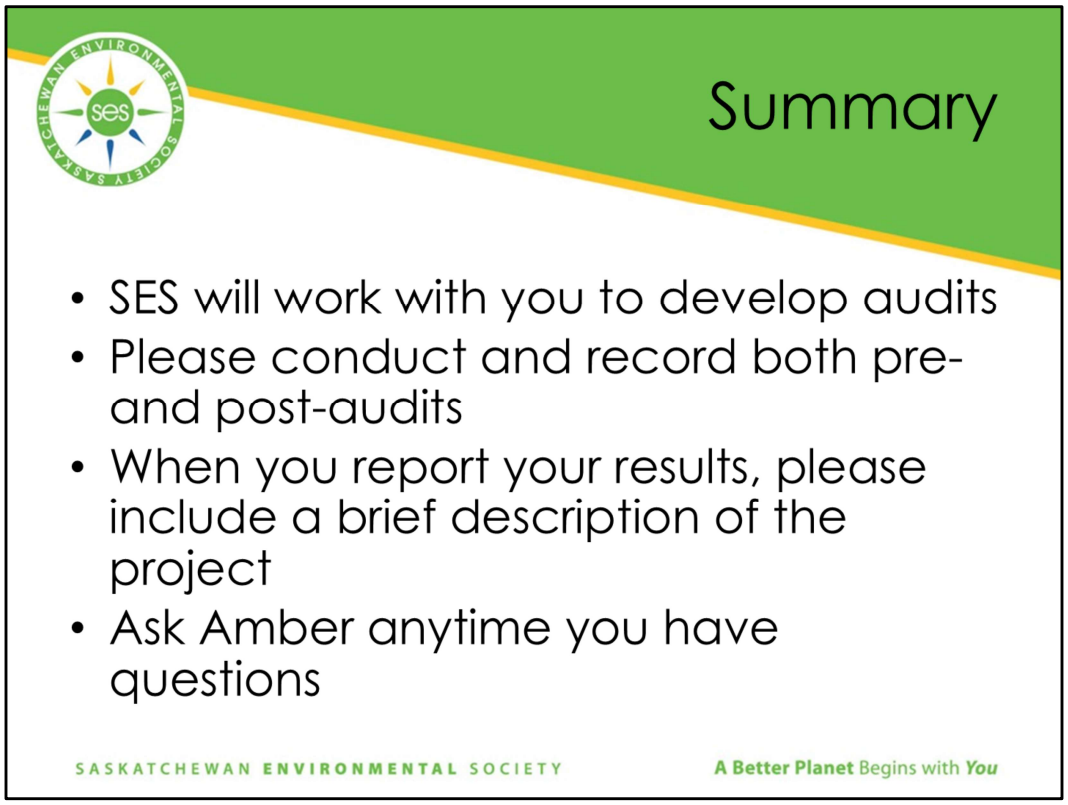
When you give us your results, we'd like complete information. How you did the pre and post audits, and what the campaign was. Include information like the whole school participated, or the Jr wing participated.

Here is one way a teacher had his students show their work. (This was from Michael Dallaire = G8 St Anne school)

This student reduced both water and electricity use at home.

I like this way of representing the whole project on one page. All the pertinent information is in one place. In the section showing "problems I encountered", other topics were "things I was surprised by", "things I learned", or "wow".

This school did a full garbage audit and then decided to focus on compost and reducing organics in the garbage.
To calculate results, I can use either the 33lb from the 5 days they collected, or the difference between 15 and 9 lbs from their pre- and post-audits. You can see that the results don't work out exactly the same, but they are close and well within the tolerances of the student projects.


Summary
• SES will work with you to develop audits
• Please conduct and record both pre- and post-audits
• When you report your results, please include a brief description of the project
• Ask Amber anytime you have questions
SASKATCHEWAN ENVIRONMENTAL SOCIETY
A Better Planet Begins with You

In summary…