

Northwest Territories High School Graduation Rate

Methodology Overview



The High School Graduation Rate was developed to help the Department of Education, Culture and Employment (ECE) estimate what percentage of students in the Northwest Territories (NWT) meet the requirements for a high school diploma within six years of starting high school.

There are many ways to calculate graduation rates; and each provides an answer to a different question.

The question that ECE aims to answer with a graduation rate is *“What percentage of high school students graduate from high school in the NWT?”*

This document provides a technical overview of the method and the decisions ECE made while developing the grad rate, including an in-depth discussion of the migration rate model. The annual [Graduation Rate Fact Sheets](#) provide the most recent results.

Significance of graduation rates

A high school graduation rate is one way to look at the effectiveness of a school system. On its own, the graduation rate tells us what percentage of high school students go on to complete the requirements for a high school diploma (also referred to as Senior Secondary School Diploma). When combined with other measures, and examined over time – as is done in the [Annual JK-12 Performance Measures Report](#) – the graduation rate helps provide a more complete picture of the NWT school system.

An important part of a graduation rate methodology is determining what it means to ‘graduate.’ There are a variety of pathways through high school, and outcomes that students can strive for, ranging from obtaining a Senior Secondary School Diploma to being accepted into a post-secondary institution.

The graduation rate should reflect the achievements of all students who are successful in high school. While some students may return to high school to take extra courses or upgrade, meeting the requirements for a diploma is a clear and measurable indicator of success in high school. As such, ECE uses the same criteria for the graduation rate as is used for the annual list of high school graduates: achieving the [requirements for high school graduation](#). When a student has met these requirements, they are eligible to receive a Senior Secondary School Diploma.

Selecting students for the calculation

It is important that each student is counted exactly once in the graduation rate. The easiest way to ensure this is to assign students to a cohort. Then, the graduation rate can be calculated by looking at all students in a cohort and counting how many graduated within six years of starting¹ Grade 10.

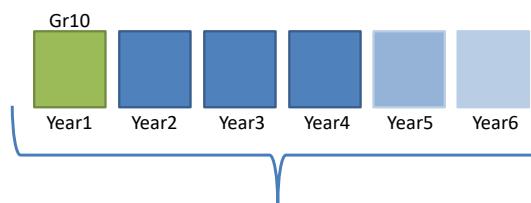
High school officially starts with enrolment in Grade 10, so students are assigned a cohort in the school year when they first enrol in Grade 10 (or would have enrolled in Grade 10 if they are a student who joined the NWT school system in a higher grade). For example, a student who started Grade 10 in the 2014-2015 school year is part of the '2014-2015' cohort.

Students who move to the NWT from other jurisdictions and enter high school in Grade 11 or 12 are also assigned a cohort. These students are called **In-Migrants**. Those who start in Grade 11 are assigned to the Grade 10 cohort of the previous school year, and those who enter in Grade 12 are assigned to the cohort from two school years before.

ECE only includes students in a cohort if they are 18 years old or younger when they enrol in Grade 10². Students who are 19 years old or older when they **first enrol** in Grade 10 are unlikely to complete high school before they are 21, and are considered mature students.

Completion time

High school students can take different pathways through high school. To allow students a wide window of time to complete high school and still have their graduation count in the graduation rate, ECE uses a six-year completion time.



ECE chose a six-year window for completion because some students may take more time to navigate the school system than others, or may not be able to complete their high school requirements within three years due to

¹ Not all students enrol in Grade 10, so a cohort includes all students who:

- Enroled in Grade 10 for the first time in a particular year (Year1);
- Enroled in Grade 11 for the first time in the following year (Year2), and have no prior record of enrolling in Grade 10 in the NWT, or;
- Enroled in Grade 12 for the first time two years after Year1 (Year3), and have no prior record of enrolling in Grade 10 or 11 in the NWT.

² For in-migrants, and other students whose first enrolment in high school is in Grade 11 or 12, ECE considers the age these students would have been 1 or 2 years prior to their first enrolment, respectively.

circumstances beyond their control, such as limited availability of core courses at their school. A six-year window ensures that all students who graduate, no matter their circumstances, have a chance to be counted in the graduation rate. Furthermore, a six-year completion window reflects the commitment of ECE to provide education to NWT residents up to the age of 21, at which point continued enrolment in high school is at the discretion of the school. Most students start Grade 10 at age 15, so this six-year window allows them to the age of 21 to graduate and still be included in the graduation rate.

Thus, all students in a cohort who obtain their high school diploma within six years of starting high school are counted as a **Completion**.

Designating a school

Students in the NWT often move between schools as they complete high school. When calculating the graduation rate at the community level (i.e. Yellowknife, Regional Centres and Small Communities), ECE needs to ensure that each student counts for only one community type. To do this, each student, at the end of the six-year window, is assigned a 'designated school.'

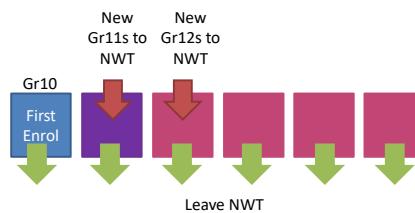
For students who graduate within the six-year window, their designated school is the one they attended when they graduated high school. Even if a student returns to high school after graduating to take extra courses or improve their grades, their designated school for the purpose of the graduation rate is still the school they graduated from.

For students that did not graduate within the six-year window, their designated school is the last school within that window that they were enroled in.

Out-Migration Rate Model

Just as **in-migrants**, or students who started high school in the NWT in Grade 11 or 12, need to be counted, ECE also needs to take into consideration high school students who move out of the NWT before they complete high school. These students are called **Out-Migrants**.

In-migrants are students who enter the NWT high school system in Grade 11 or 12 for the first time. They need to be assigned to a cohort so that they are counted.



Out-Migrating Students are those who leave the territory before graduating. If out-migrants are not removed from the cohort, the grad rate will be artificially lower.

Out-migration

Some students start high school in the NWT and finish in another jurisdiction. If these students are not removed from the graduation rate calculation, the rate will be lower than it should be, as it would count as a drop-out. By

removing out-migrants from the cohort, ECE's graduation rate is a more accurate representation of the rate of high school graduation within the NWT.

However, NWT student record data does not consistently track if a student drops out of school or moves out of the territory. To overcome this data limitation and ensure the six-year graduation rate is as accurate as possible, ECE uses a model to estimate the number of students in a cohort that are 'out-migrants,' and then subtracts that number from the total number of students in the cohort.

Proxy population

The out-migration model uses a proxy population of students in grades 1-4 to estimate the rate of out-migration in the NWT by ethnicity and community type.

A proxy population is a population that is different from the target population and is used as a stand-in to estimate features of the target population. The challenge with student record data is that ECE cannot reliably differentiate between high school-aged students who dropped out of school, and students who moved out of the jurisdiction. In grades 1-4, however, it can be assumed that a student who no longer attends school has moved, because students in those grades cannot elect to drop out. ECE first determines the out-migration rate of students in grades 1-4 each year of a cohort, and then uses that to estimate the number of students in the cohort who out-migrated within those six years.

Grades 1-4 are used to get the greatest possible number of students in the model. The more individuals counted, the more accurate the model – and as the NWT has a small student population, aggregating data over multiple years and multiple grades helps to statistically compensate for the small population and improve the accuracy of the model.

Key variables: Ethnicity, Gender and Community type

ECE conducted analyses of Statistics Canada's migration data over the last decade (2010-2020) to determine what factors most affect the probability that a family, and more specifically a student, migrates out of the NWT within six years. It was determined that ethnicity (Indigenous vs non-Indigenous), and the size of community they live in (Small Community, Regional Centre, or Yellowknife) are the key variables for migration in the NWT. We also include gender in the model for completeness.

Enrolments in grades 1-4

The first step of building the model is to count the number of students enroled in grades 1, 2, 3 and 4 each year, according to each of the key variables. The results are in the **Enrolments** column of the following chart:

Year	Grade	Ethnicity	Community Type	Gender	Enrolments
Year1	1	Indigenous	Small Community	Female	X
Year1	1	Non-Indigenous	Small Community	Female	X
Year1	2	Indigenous	Regional Centre	Female	X
...

Since the completion window is six years, for each out-migration model, six years of Grade 1-4 enrolments are counted for each Grade, Ethnicity, Gender and Community Type.

The final table has 288 rows.

It is important to note that this model does not use a cohort method. Each year is treated as a snapshot of the student body in that year, and so a student who is enrolled in Grade 2 in Year1, who remains in the NWT, will be part of the enrolment count for Grade 3 in Year2.

Out-migration in grades 1-4

Once enrolments are counted, ECE counts the number of out-migrants for each Year, Grade, Ethnicity and Community Type, which is the same table as shown above with the Enrolments column replaced by **Out-Migrants**:

Year	Grade	Ethnicity	Community Type	Gender	Out-Migrants
Year1	1	Indigenous	Small Community	Female	Y
Year1	1	Non-Indigenous	Small Community	Female	Y
Year1	2	Indigenous	Regional Centre	Female	Y
...

A student in YearX in Grade 1-4 is considered to be an out-migrant if the following conditions are true:

- They do not appear in any Grade, in any Community Type in the NWT in YearX+1
- They do not appear in any Grade, in any Community Type in the NWT in Year6

Out-migration rates for grades 1-4

Once the enrolments for each year and the number of out-migrants are counted, ECE is able to compute the out-migration rate for the entire six-year window for students in grades 1-4.

First, all of the Year and Grade values are added together to get a final table that looks like this:

Ethnicity	Community Type	Gender	Total Enrolments	Total Out-migrants
Indigenous	Small Community	Female	X	Y
Indigenous	Regional Centre	Female	X	Y
Indigenous	Yellowknife	Female	X	Y
Indigenous	Small Community	Male	X	Y
Indigenous	Regional Centre	Male	X	Y
Indigenous	Yellowknife	Male	X	Y
Non-Indigenous	Small Community	Female	X	Y
Non-Indigenous	Regional Centre	Female	X	Y
Non-Indigenous	Yellowknife	Female	X	Y
Non-Indigenous	Small Community	Male	X	Y
Non-Indigenous	Regional Centre	Male	X	Y
Non-Indigenous	Yellowknife	Male	X	Y

Then, for each Ethnicity, Community Type and Gender category, the number of Out-Migrants (Y) is divided by the number of Enrolments (X), to get an out-migration rate for that category of student.

ECE also calculates, using the same method, an out-migration rate for the Ethnicity + Community type categories, without gender. This is calculated separately because non-binary students are included, but are not included in

the Male/Female out-migration rate calculations. Non-binary students are, at present, too few to have an out-migration rate model for just their gender category.

The out-migration rate is a percentage and represents the average proportion of the student body over a six-year window that migrated out of the territory.

Applying the migration models

The result is a separate out-migration rate for each category of Ethnicity + Community Type + Gender. These are used when the graduation rates are calculated to estimate the number of high school students in the cohort that have moved out of the territory before they had a chance to graduate.

For example, the number of out-migrants in a cohort of students in Small Communities is calculated as follows:

$$\begin{aligned} & \text{Number of Outmigrants} \\ &= (\text{Number of Students in Small Communities in Cohort}) \\ & \quad * (\text{Outmigration rate for Small Communities over 6 Years}) \end{aligned}$$

This number is then used in the following calculation to get the graduation rate for Small Communities:

$$\frac{\text{Number of Students in Small Communities in Cohort who Graduated within 6 Years}}{(\text{Number of Students in Small Communities in Cohort} - \text{Number of Estimated Outmigrants})}$$

Putting it all together

To calculate the graduation rate, ECE counts the number of **Completions** in a cohort and divides that by the total number of students in the cohort minus the total number of out-migrants as estimated by the outmigration model for that six-year window.

So, the graduation rate published using the graduation record up to 2019-2020 was calculated as follows:

$$\frac{\text{Number of students in '2014 – 2015' cohort who completed by 2019 – 2020}}{\text{Number of students in '2014 – 2015' cohort} - \text{Estimated Number of OutMigrants}}$$

And more generally:

$$\frac{\text{Completions}}{\text{Cohort Size} - \text{Estimated OutMigrants}}$$

A separate graduation rate, including a migration-rate model, is calculated for each 'level' of analysis that the graduation rate is reported at. This includes:

- Community Type (Small Community, Regional Centres, Yellowknife)
- Ethnicity (Indigenous, Non-Indigenous)
- Gender (Male, Female)