Network for Learning:
Te Pūrongo Whakakitenga Data & Insights Report

RELEASED 8 JULY 2021

He pēhea tā mātou tūhono, tautiaki me te tautoko i ngā ākonga o Aotearoa mā te ako matihiko

How we connect, protect and support New Zealand ākonga learning online

TE WEHENGA TUARUA O TE TAU AKO A TE KURA 2020 | 20 O HŌNGONGOI – 18 O HAKIHEA 2020
SECOND HALF OF THE 2020 SCHOOL YEAR | 20 JULY - 18 DECEMBER 2020

Rārangi Upoko | Contents

Kōrero Whakataki | Introduction

Hei tā Network for Learning (N4L) me tā mātou pūrongo whakakitenga raraunga e āta titiro ana ki ngā raraunga puta noa i ōna Whatunga Whakahaere, e whakamahi ana e te 800 mano ākonga me te 55 mano kaiako mō te ako.

Koia hoki tētahi o ngā Whatunga Whakahaere nui rawa o tōna ake momo puta noa i te ao, e tūhono ana ki ngā 2,450 kura puta noa i a Aotearoa he mea haumaru, ipurangi horopū, e tautīaki ana i te tuatini e pokea ana ki ngā whakawhiunga matihiko, matū hangarau ia rā.

He mea kōtuitui, tautīaki hoki a N4L i ngā ākonga me ngā kura whakamahi i te ipurangi. Waihoki he tautoko i ngā pou ārahi o ngā kura me ngā kaimahi hangarau ki ngā kaimahi tino mātau mai i te pae āwhina me te hunga whakahaere i ngā tauwhanaungatanga o ngā kura. Ka toro haere rātou i ngā kura kotahi mano neke atu ia tau.

Mā tēnei e arotahi ai ngā kura ki te āta whakaako me te ako i a rātou tamariki i roto i te āhurutanga mōwai rokiroki, ko tā N4L he tiaki he tautoko hoki i ngā ara matihiko.

He whakaatu tēnei pūrongo i a mātou mahi tūhono, tautīaki me te tautoko i ngā ākonga o Aotearoa ki te ako matihiko. Ka whakaaturia hoki ngā momo raraunga puta noa i tā mātou Whatunga Whakahaere rerekē mai i ngā momo kura, ahakoa nui, ahakoa ā rohe, ahakoa nō ngā ākonga o ngā kura tuatahi tae noa atu ki ngā kura tuarua. He mea tāmuramura a mātou matihiko haumaru me ngā ārai whakatumatuma puta noa i tā mātou whatunga.

E mārama ana te kite i te nui o te whakamahi a ngā ākonga i te iarangi, e kimi huarahi ana ki te ako i te kura i waho hoki i te kura. E tipu haere ana te hunga māminga e mahi whakatuma matihiko ana kei te hahae ana i ngā here tiaki i ngā pūnaha matihiko.

Mā tēnā e kore e mutu te mahi a N4L. Ka ūkaha te pakihi ki te whakangao i te pūnaha me ngā tāngata ki te kawe i ngā hōtaka kia eke panuku kia eke tangaroa ai ngā hangarau, kia haumaru, kia māmā te whakamahi, kia kukune ai ngā hangarau e rite ai ki ngā hiahia o ngā hapori-ā-kura.

He mahi nui whakaharahara tēnei i runga hoki i te tautoko a ō mātou hoa haere a te kāwanatanga, mātauranga me te hangarau. Tērā tonu te aronga kia horahia ēnei whakakitenga rarauranga i roto i tēnei pūrongo ki te hunga whakatau-tikanga e whāngai ana ia mātou hapori-ā-kura.

Network for Learning's (N4L) second Data & Insights Report looks into the data consumed across our Managed Network, used by 800,000 ākonga (students) and 55,000 kaiako (educators) for learning.

It is one of the larger managed networks of its kind in the world, connecting more than 2,450 schools across Aotearoa to safe, reliable internet, while protecting users from millions of online threats and harmful digital content daily.

N4L connects and protects school internet users, while also supporting school leaders and technology staff with a team of specialised Helpdesk operators and School Relationship Managers who collectively visit a large proportion of schools every year.

This allows schools to focus on teaching and learning in a safe and seamless online environment, while N4L manages and supports the technology.

This report reflects the work we do to connect, protect and support New Zealand ākonga learning online. It shows that the data consumed across our Managed Network differs depending on school roll size, location and between primary and secondary students. The online safety and security threats blocked across the network are also highlighted.

It is evident that students are using more bandwidth, finding new ways to learn online within the school and beyond the gate. Online threats are becoming more sophisticated, with malicious attempts to exploit IT system vulnerabilities rising substantially.

In this vein, N4L's job is never done. The company continues to invest in our systems and people, with several programmes of work underway to ensure our technology is fit for purpose, safe and secure, and easy to use, while catering to evolving needs of our diverse school communities.

It is a massive job and one we do with the support of many partners across government, education and technology. The intent is to share the data and insights uncovered in this report with the growing network of organisations and decision-makers serving our school communities.

Ka pōhiritia e mātou ōu koutou whakaaro! A, tēnā koa īmēra mai ōu koutou whakakitenga ki insights@n4l.co.nz Mehemea e hiahia ana koe ki te tuku whakaaro mai ki tā mātou ohu kia whiwhi hoki i a koe tētahi pātuhi hai te tānga mai o tā mātou pūrongo.

And we welcome your feedback! Please email us at insights@n4l.co.nz if you would like to send input to the team and receive a notification of when our next report is published.

Ngā rā whakapūrongo | Report dates

We focus on the second half of the 2020 school year, specifically Terms 3 and 4, which ran from 20 July to 18 December.

School internet use varies when regions move in and out of COVID-19 alert levels. During these times, students were learning away from school and not using our network. They were also away during school holidays, with senior students away for NCEA study leave and subsequent exam period.

For this report, Auckland students in Years 0 - 11 were away from school for 13 weekdays, with Years 12 & 13 students away for between 3 - 13 school days. Given 34% of New Zealand students are based in the Auckland region (around 272,000 students), this has impacted data use patterns.

Our first Data & Insights Report focused on the second 2020 school term which ran from 15 April - 3 July 2020, and included 22 weekdays when schools were closed due to the nationwide COVID-19 lockdown. The intent is to produce these reports on a six-monthly cadence.

Ngā mōhiohio raraunga | About the data

All information in this report is aggregated and no school or individual can be identified. You can find out more about how N4L collects and uses data from the Managed Network in our Privacy Statement.

N4L's Managed Network internet services are used by all state and state-integrated schools. When school internet users visit and search for websites, the amount of data consumed, and where it stems from (website domains), is collected in accordance with our Privacy Statement. Data consumption includes automated traffic such as software updates. Daily student data consumption is calculated by dividing the data consumed each day by the number of students connected to our network (795,490).

When attempts are made to visit websites that our technology has blocked for safety and security reasons, these are recorded through either our Web Filtering, Firewall or DNS Threat Protection services. These services are provided by enterprise-grade global cybersecurity companies and are continuously updated in response to the evolving online threat landscape. It should be noted that visiting a single website can trigger multiple data requests through a school's connection. For example, a banner advert or a third party widget embedded in a website can send requests to other websites without the user clicking on these links.

Ngā tāmuramura | Highlights

for the second half of the 2020 school year

TŪHONO | CONNECT

School data use

+ Every day, a student typically consumes 268 megabytes (MB) of data.
+ Data use jumps 32% from the first half of the year, despite an Auckland-wide lockdown in August.
+ Secondary school students consume 2.5 times more data than primary school students.
+ Students at smaller schools (<100 students) consume more data than students at larger schools.
+ Students in the West Coast region use the most data (375 MB each day), with Marlborough students using the least (158 MB).
+ Streaming media sites comprise 24% of all data consumed across the Managed Network, with YouTube, Apple, Netflix, and TikTok being the most popular sites in this category (in that order).

Browsing time - top 10 websites

+ School internet users spend the most time on sites owned by Google, Apple and Microsoft.
+ Collaboration platforms that allow student classwork to be shared with teachers and parents are among the most popular education websites (Hāpara's Teacher Dashboard, Seesaw, and Linc-Ed).
+ More time is spent using online reading resources than maths (Grammarly, Language Perfect, Epic).

TIAKI | PROTECT

Online security threats

+ Cyber security threats continue to rise - they're up 17% from the first half of the year.
+ There are 2.3 million online security threats blocked every day, or 1,592 each minute.
+ More than half of these security blocks are made at secondary schools.
+ Malware and malicious websites are the most blocked online threats.

Unsafe websites

+ Blocks to harmful digital content are also rising - they're up 37% from the first half of the year.
+ There are 2.2 million safety blocks per school day, or 1,529 per minute.
+ Anonymisers are the most commonly blocked type of unsafe website.
+ Pornography represents 1% of all website blocks.

All website blocks

+ Blocks to all websites are up 80% from the first half of the year, with 45 million websites blocked every school day.
+ Gaming websites represent 20% of all websites blocked.
+ Instant messaging represents 7.5% of all blocked websites. They increased by 220% in primary schools and 80% in secondary schools, with Google Hangouts, Snapchat, and Discord blocked the most.
+ Social networking represents 6.6% of all blocked websites. The most blocked social networking sites were Instagram, Facebook and Pinterest.

TAUTOKO | SUPPORT

+ Schools are 95% satisfied with N4L's support services.

Tūhono - Te tuitui i ngā raraunga ki ngā Kura | Connect - Data use in Schools

N4L connects 2,457 schools across Aotearoa to a fast, reliable, safe and secure internet for learning. These schools include:

1,916 primary schools[1], attended by more than 493,000 students.

465 secondary schools, attended by more than 299,000 students.

Second half of school year

Every day, a student typically consumed 268 megabytes (MB) of data. That's 32% more than the first half of the year[2]. At primary schools, data consumption increased by 39% and by 28% at secondary schools.

Some of this increase can be attributed to students spending more days at school.

Auckland lockdown impact on data use

Remote learning took place in Auckland in August due to a change in COVID-19 alert levels. It should be noted that data continues to pass through our network even when students are away from school, as a result of things like software updates and 'always-on' applications.

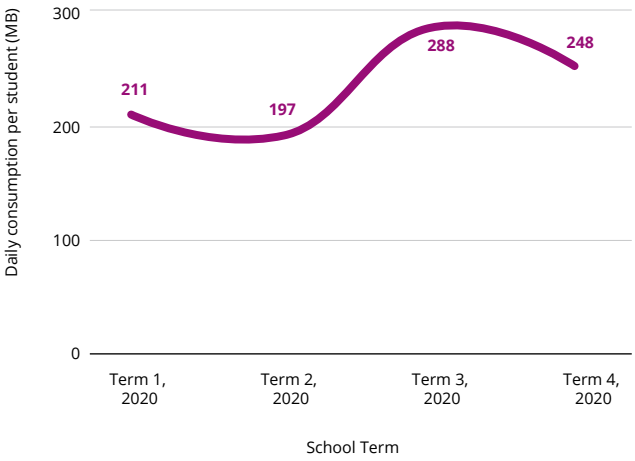
Lockdown dates - Most Auckland students (270,000 in number) were away from school from Wednesday, 12 August until Friday, 28 August, and not using N4L's network during those 13 school days. However, around 37,000 students in Years 12 & 13 were permitted to return to school from 18 August, so these students may have only missed 3 days of in-school learning.

Lockdown impact - The absence of Auckland students on site at school had a noticeable effect on nationwide data use. National daily consumption lowered to 254 MB per student during the Auckland lockdown, but bounced back to 301 MB during the rest of Term 3. In Auckland, 81 MB was consumed for each student per day during the lockdown, increasing to 281 MB when all students were permitted to return to school.

Term by term data use

The following graph shows daily student data use over each of the 4 school terms. Note the dip in Term 4 is likely a result of fewer students using the network, with senior secondary students away from school on study leave, preparing for exams beginning in November.

Daily consumption per student in 2020

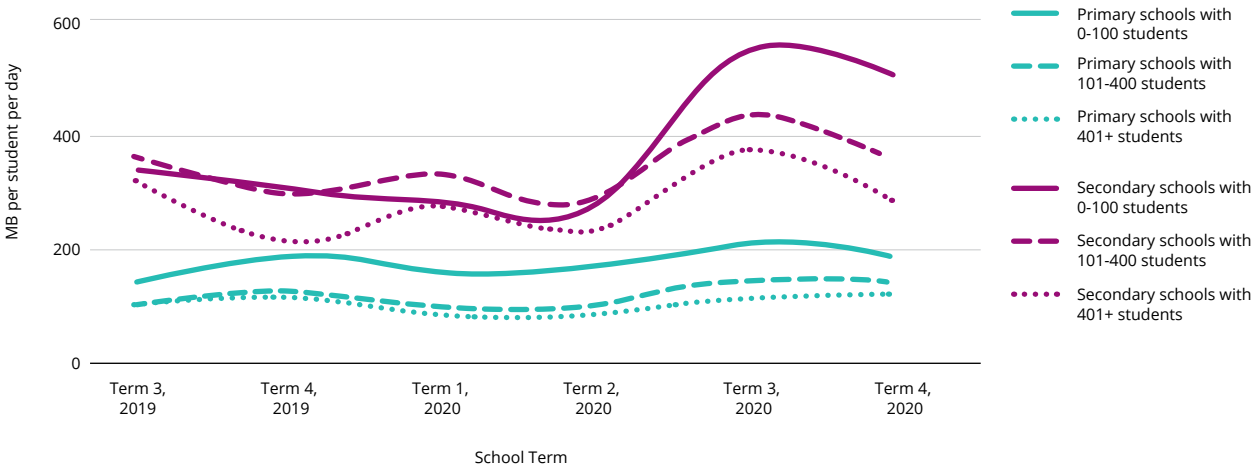


[1] Refer to glossary for a definition of primary and secondary schools
[2] First half = Terms 1 and 2; Second half = Terms 3 and 4

Data use by school size

The graph below compares daily student data consumption by school size and type.

Consumption per student per day



Secondary school students consume 2.5 times more data than primary school students:

Primary schools - daily data use per student

135 MB

Students attending schools with 100 or fewer students consume the most data. Consumption habits are similar among students attending mid-size and larger primary schools.

Secondary schools - daily data use per student

338 MB

Students attending smaller secondary schools used more data than larger schools. Data consumption declined in Term 4, when many are away from school.

Type of data consumed

Data consumption is grouped into categories assigned by our technology providers. Two of these categories include streaming media and social networking. Streaming media is defined as websites hosting multimedia files that can be played or downloaded (e.g. video or sound).

Streaming media data

24 % of web traffic

Daily consumption of streaming media grew by 124% between the first and second half of the year, with 29 TB consumed each day across the network. When measuring data consumption, YouTube continued to be the most popular streaming media site for both primary and secondary schools. This is followed by Apple, Netflix and TikTok, with the latter making up a very small percentage of all streaming data (less than 1%).

Social networking data

1.4 % of web traffic

Daily consumption grew by 60% between the first and second half of the year, with 1.7 TB consumed each day across the network. When measuring data consumption, Facebook remains the most popular social media network within schools.

Data use by region

In general, data consumption across the regions was fairly consistent with what we found in our first report. Average student consumption increased in Northland in the second half of the year, surpassing data consumption in Auckland.

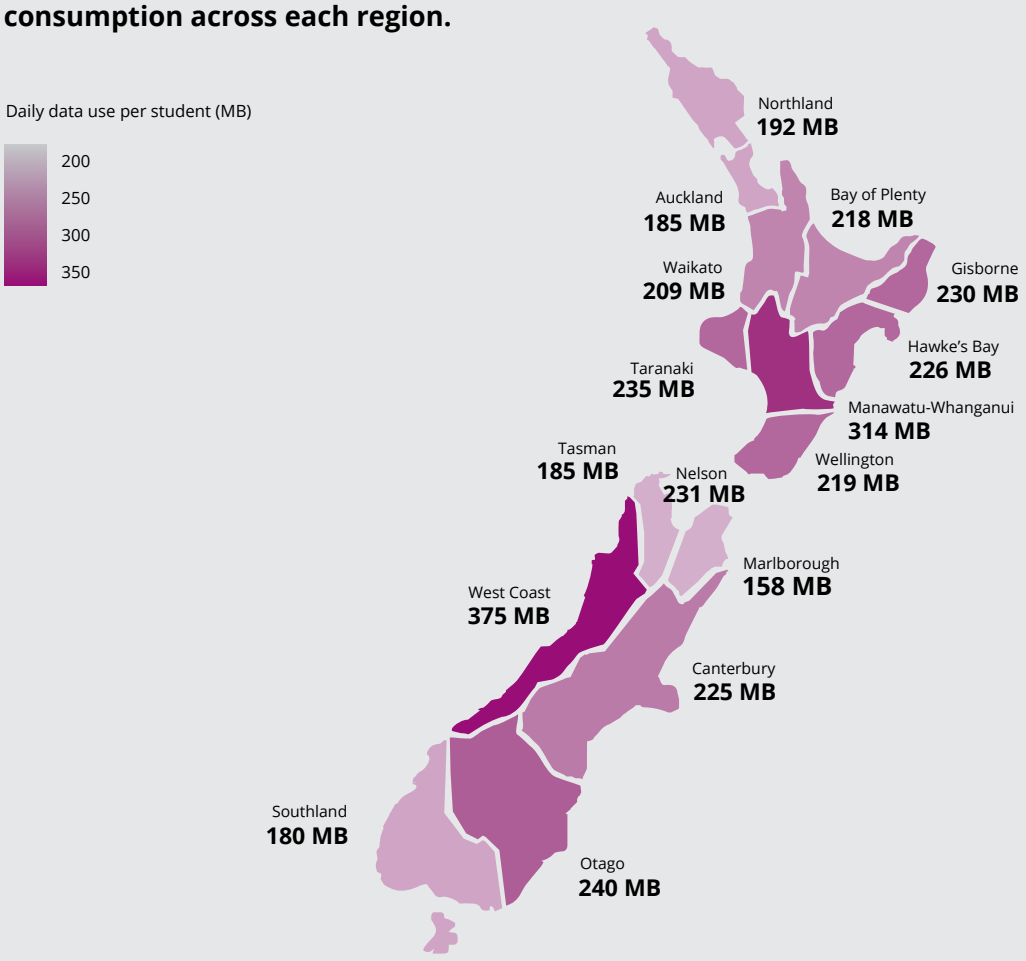
Auckland students consumed less data than all but two other regions (Southland and Marlborough), and consumed the same amount of data as students attending schools in the Tasman region.

These regions have few schools (less than 40 each), which could explain why their data use falls at the extremes.

West Coast schools tend to be small, with nearly half having fewer than 100 students compared to nearly a third in Marlborough. As small schools tend to use more data per student, this may contribute to why student consumption was so high on the West Coast.

Continuing the trend seen in our first Data and Insights Report, the West Coast and Marlborough regions fell at opposite ends of the data consumption spectrum, with West Coast students consuming the most data and Marlborough students consuming the least.

The graph below shows daily student data consumption across each region.



Websites and browsing time

The two tables indicate where school internet users are spending the most time online, and are ranked according to the total browsing time spent on each site.

For this analysis, website sub-domains are grouped under the larger domain names. For example, traffic going to edu.google.com is classed as Google traffic. Note, if a student spends more time on a website, it does not necessarily mean they are consuming more data from that site. For example, more data is consumed per minute while using a streaming media website versus a text-heavy website with minimal images or video.

A list of the top 30 websites related to education is shown in Appendix 3.

Top 10 websites by browsing time: all websites

Primary (All)	%	Secondary (All)	%
Google	64.6%	Google	43.9%
Apple	8.6%	Microsoft	23.1%
Microsoft	6.0%	Apple	3.4%
Hāpara Teacher Dashboard	2.2%	Facebook	2.3%
Facebook	1.7%	Linewize	1.9%
Linewize	1.1%	Hāpara Teacher Dashboard	0.6%
Seesaw	0.4%	Spotify	0.5%
eTAP	0.3%	Snapchat	0.3%
Spotify	0.3%	Adobe	0.3%
Epic	0.3%	Instagram	0.3%

Note some of the above websites might be 'always on' in the background, as they are a tool for facilitating or administering education activity. In general, these tools may run applications that may be active all day and outside of school hours.

Top 10 websites by browsing time: education

Primary (Education)	%	Secondary (Education)	%
Hāpara Teacher Dashboard	39.1%	Hāpara Teacher Dashboard	33.4%
Seesaw	7.7%	Grammarly	15.0%
eTAP	7.1%	G Suite for Education (Google)	11.6%
Epic	5.4%	school.nz	5.2%
Grammarly	4.0%	Texthelp	4.5%
Prodigy Education	3.9%	Language Perfect	3.6%
Linc-Ed	3.8%	Education Perfect	3.1%
3P Learning	2.9%	Kahoot	2.2%
G Suite For Education (Google)	2.8%	govt.nz	1.6%
Kahoot	2.2%	Seesaw	1.5%

All website types

School internet users are spending most of their browsing time on websites offering collaboration suites and platforms for creating, sharing, managing and visualising content. They also use sites that report on content filtering, a capability that N4L is developing for schools as they migrate to new wireless network infrastructure.

Google, Apple & Microsoft: The world's largest technology companies are listed among the top 3 most accessed websites for primary and secondary schools, with Google featuring most prominently. Primary school students spend more time on Apple than Microsoft, while the reverse is true for secondary school students. It is worth noting that automated software updates are released frequently by these 3 companies, with the majority of the devices connecting to our network produced by these brands.

Social networking and streaming services: Two social media sites, Snapchat and Instagram, did not feature on the lists for the first Data & Insights report and are now on the secondary schools' list. Feedback from the education community shows that students are using instant messaging within popular social media sites to create classroom chat groups for discussing school work, while schools are also using Facebook groups to share information with their parent communities. Spotify hosts music and podcasts that can be used to aid learning.

[3] https://www.n4l.co.nz/wp-content/uploads/2021/01/N4L-DataInsights-21.01.21.pdf

Education-related websites

While the order of these websites may differ slightly, the websites remain largely the same from the lists presented in our first Data & Insights Report[3]. The exception is ClassDojo, which has dropped off both lists.

The type of websites in the education category include:

+ **Collaboration platforms** that allow student classwork to be shared with teachers and parents (Hāpara's Teacher Dashboard, Seesaw, and Linc-Ed)
+ **Online learning resources** (Prodigy Education, Kahoot, 3P Learning, Education Perfect, Grammarly, Texthelp and Epic)
+ **Administrative sites**, including tools allowing schools to manage student administration (eTAP) and documents (Google Suite for Education).
+ **School- or government-owned websites** (ending in school.nz or govt.nz)

Online learning

Maths

+ **Primary schools - Two of the top 10 websites offer maths learning activities:** Prodigy Education and 3P Learning, with the former focusing solely on maths and the latter offering a range of resources in addition to maths, like spelling and literacy.
+ **Secondary schools - One of the top 10 websites includes maths learning activities** (Education Perfect), while Kahoot allows users to generate multiple-choice quizzes on any topic, including maths.

Reading and Languages

+ **Primary schools - Four of the top 10 websites offer language or literary related resources:** Grammarly, 3P Learning, Epic and Kahoot.
+ **Secondary schools - Half of the top 10 offer language learning resources:** Grammarly, Education Perfect, Language Perfect, Texthelp and Kahoot.

Tiaki – Haumaru me te ārai i ngā Ipurangi | Protect – Safe & Secure Internet in Schools

N4L's Safe & Secure Internet services

N4L protects students from the worst of the web by applying a default level of safe and secure internet services. N4L's Safe & Secure Internet includes a combined web filtering and firewall solution, as well as a DNS (Domain Name Service) threat protection service. The service is used to:

+ **Block online security threats** like phishing scams, malware and DDoS (Distributed Denial of Service) attacks.
+ **Block unsafe website** categories hosting harmful digital content, such as explicit violence, substance abuse, illicit hacking activities, as well as 'anonymiser' sites which can be used to bypass filtering.

Schools can also use N4L's filtering to block additional websites deemed inappropriate or distracting for learning, such as gaming or social media sites.

Blocking online security threats

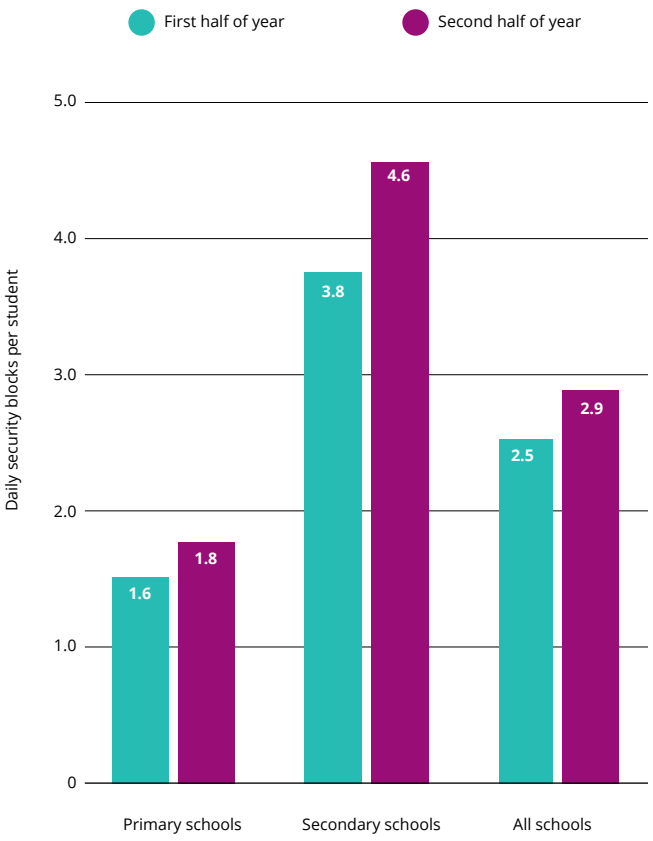
Websites hosting malicious software and other online threats are blocked by N4L's filtering by default. These are called security blocks, with 257 million made during the second half of the school year.

This translates to 2.3 million online security threats every day, or 1,592 each minute.

We noted a **17% rise in the number of daily security blocks** since the first half of the year, demonstrating the continued rise of online threats as the year progressed.

Security blocks were more common among secondary schools, with more than 4 blocks per secondary school student recorded each day during the second half of the school year, compared with fewer than 2 per primary school student.

Online security blocks in 2020



Trends in online security threats

+ **Blocks to malware and malicious websites represented the most commonly blocked security threat, with 491 blocks for each school made every day.** They increased by 68% since the first half of the year. An adware tool called id5-sync was partially responsible for this increase, being blocked more than 17 million times during the reporting period. This malicious tool tracks browsing activity and generates annoying pop-up ads.

+ **Phishing attempts declined by 27%** in the second half of the year, with 152 blocked at each school every day.

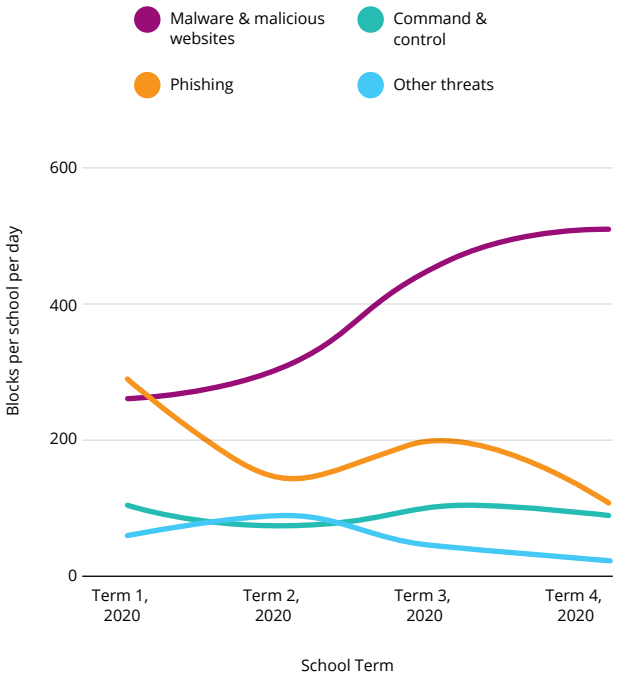
+ **The number of Distributed Denial of Service (DDoS) attacks has declined**, with 68 large-scale blocks made in the second half of the year compared to 174 during the first half. More than 60% of large-scale DDoS blocks occurred at secondary schools. Unlike previous years, we did not see larger peaks of activity during exams, with only 29 large-scale blocks made across October and November 2020.

Since N4L's previous report, we have changed the way we report on the security block categories:

+ Viruses are now included in the 'Other threats' category, as are Intrusion Prevention Service blocks (previously called unauthorised access attempts).

+ The data used for recording malicious websites in our first report was incomplete. Malware and malicious websites were the most commonly blocked threats.

Daily security blocks in 2020



Blocking unsafe websites

Websites hosting harmful digital content such as pornography or graphic violent images are also blocked by N4L's filtering by default. These are called safety blocks, with 238 million made during the second half of the school year. This translates to 2.2 million safety blocks per school day, or 1,529 per minute.

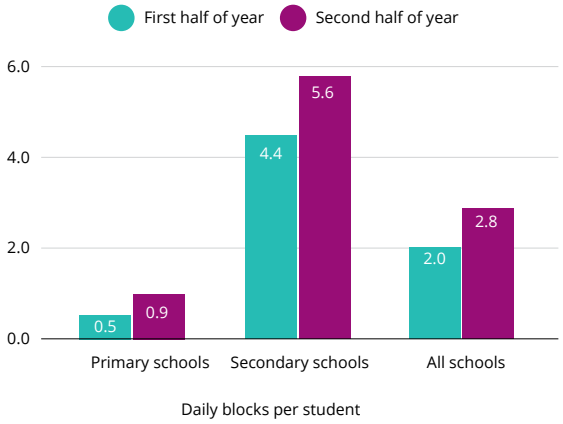
It's also a **37% increase** from the 1.6 million daily safety blocks recorded in the first half of the year.

Safety blocks represented 5% of all blocks made across the Managed Network.

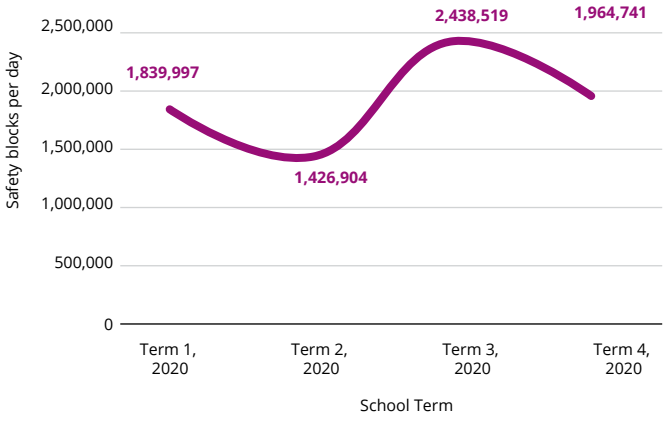
Safety blocks were more common in secondary schools, with 5.6 per secondary school student recorded each day. Fewer than 1 safety block per student per day was made at primary schools.

Safety blocks for all schools **peaked during the third school term**, with 2.4 million recorded each day.

Safety blocks per student per day



Safety blocks across 2020

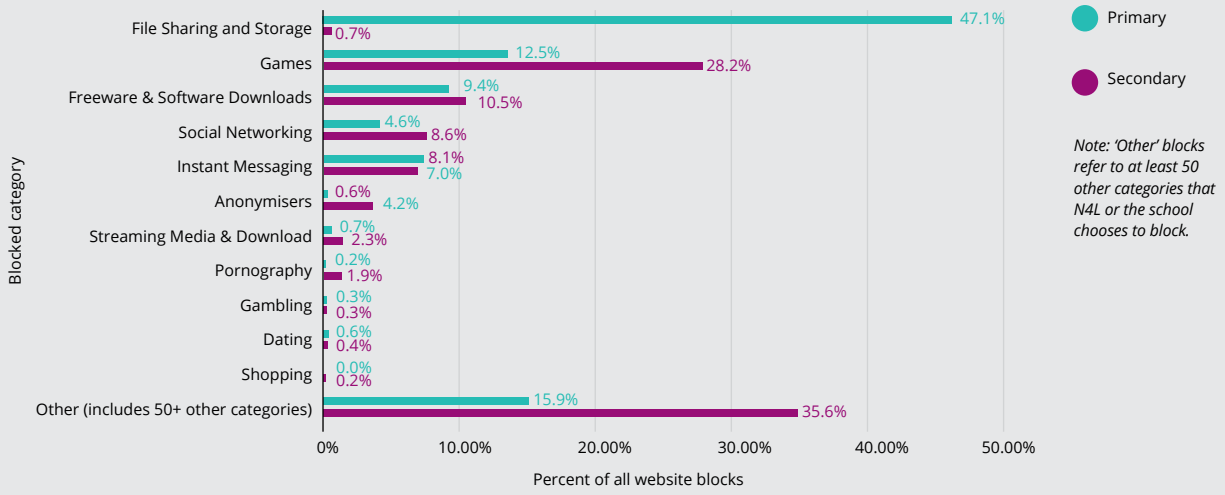


All blocked website categories

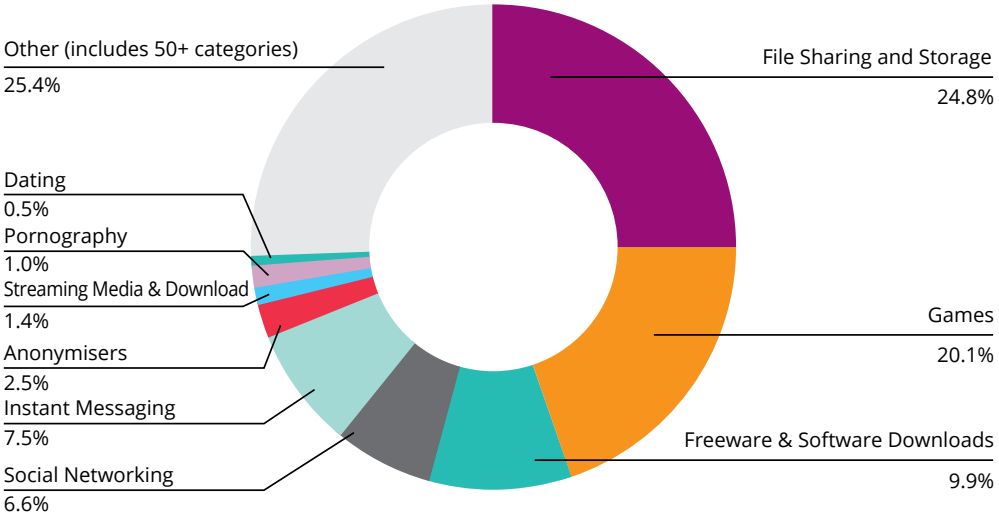
If we look at all blocked websites, **45 million were blocked every school day** (4.9 billion total), representing an 80% increase compared to the first half of the year.

This graph shows some of the frequently blocked website categories during the second half of the school year.

Commonly blocked categories by school type



Commonly blocked categories



A closer look into blocked website categories

Insights into some of the most frequently blocked categories:

File sharing and storage websites were blocked the most, and comprised 25% of all blocked websites; with the majority of these blocks made at primary schools (94%). This category includes content hosted on websites like iCloud, Dropbox, or other file storage sites.

Gaming continued to represent 20% of all website blocks, with over twice as many gaming blocks made at secondary schools each day compared with primary schools. The number of gaming blocks increased by 129% in primary schools and 94% in secondary schools.

Freeware and software downloads represented nearly 10% of all website blocks. These increased by 46% since the first half of the year. Blocks to Google Play were the most common in this category.

Instant messaging represented 7.5% of all website blocks. They increased by 142% between the first and second halves of the year. Instant messaging blocks were more common in secondary schools, with 4 blocks for each student every day compared to 3 in primary schools. However, these blocks increased by 220% in primary schools and 80% in secondary schools since the first half of the year. The most commonly blocked instant messaging sites included Google Hangouts, Snapchat and Discord.

Social networking represented 6.6% of all website blocks. They increased by 20% in primary schools and decreased by 21% in secondary schools. Social networking sites were blocked more frequently in secondary schools, with the average secondary school student experiencing 5 blocks each day while the average primary school student experienced fewer than 2. The most blocked social networking sites were Instagram, Facebook and Pinterest.

Anonymisers represented 2.5% of all website blocks. They increased by 36% overall in the second half of the year, with most of them made by secondary schools (81%). While these blocks occurred at school, it is interesting to note that anonymiser blocks also feature prominently in N4L's Switch on Safety filter, used by parents and caregivers to block unsafe websites from home (refer to Appendix 5).

Pornography represented 1% of all website blocks. These decreased by 10% in secondary schools, yet increased by 99% in primary schools. With the majority of these blocks made at secondary schools, the overall number of pornography blocks across the network decreased by 6% between the first and second half of the year.

Tautoko - mō ngā Kura me ngā Ratonga Matihiko | Support - for Schools and their Technology Providers

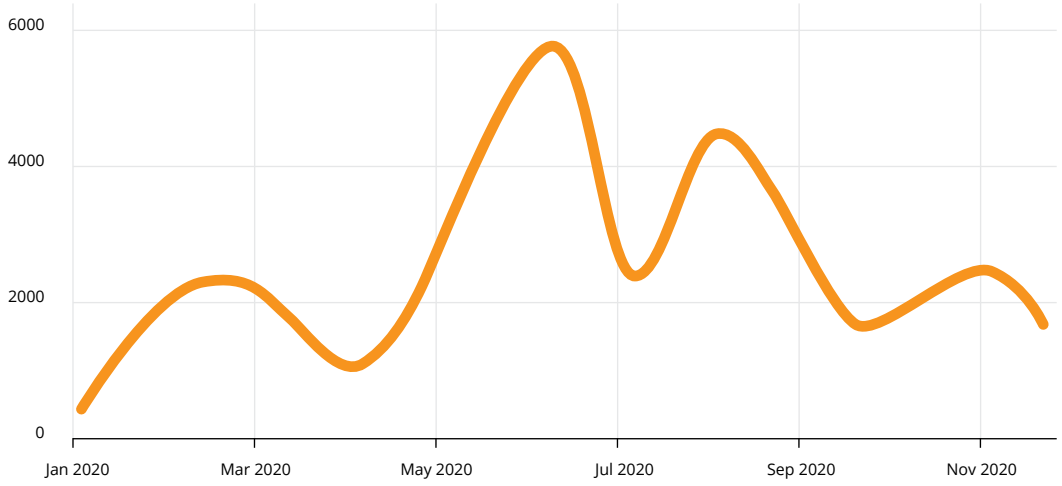
The N4L Helpdesk team ensures schools have access to the support they need, with schools able to log cases via N4L's Support Hub or by calling the Helpdesk. Further, N4L's team of six School Relationship Managers visited 523 schools during the second half of 2020.

The people contacting N4L's Helpdesk range from teaching principals with little or no tech knowledge, to technology companies calling on behalf of the schools they are engaged to support. The latter group represents around 40% of all Helpdesk callers.

Contact to N4L's Helpdesk decreased by 4% between the first and second halves of the year, with contact peaking in August following a campaign to promote N4L's Safe & Secure Internet services.

The graph below shows the number of N4L Helpdesk support cases opened per month. The highest number of cases recorded in the second half of the year was in August and September.

Number of support cases opened per month



94% Term 3, 2020 **96%** Term 4, 2020

Schools **satisfied** with N4L support.

72% Term 3, 2020 **88%** Term 4, 2020

The number of support calls **answered within 30 seconds**.

32% Term 3, 2020 **39%** Term 4, 2020

The number of 'service requests', for help with configuring new hardware or similar.

5% Term 3, 2020 **4.6%** Term 4, 2020

Fewer than 10% of calls are related to incidents impacting the network for that school.

N4L's remit is expanding as we increase our support for school networks, cybersecurity and NZQA online exams. Accordingly we are constantly enhancing the services and increasing the channels schools can use to interact with N4L and keep them informed about our technology.

Papakupu whāiti | Glossary

Anonymisers	Anonymiser services, such as VPNs (virtual private networks) can be used to defeat filters, allowing internet users to browse websites that may otherwise be blocked by N4L's filtering.
Command and control server attack	Computers controlled by attackers are used to send commands to systems compromised by malware; this computer is called the command & control server. This enables attackers to receive stolen data from targeted networks.
Distributed Denial of Service (DDoS)	A distributed denial-of-service (DDoS) attack is a malicious attempt to disrupt normal internet traffic of a targeted server, service or network by overwhelming the target or its surrounding infrastructure with a flood of internet traffic.
Primary and secondary	In this report, primary schools include years 0-8 and secondary schools include Years 9-13. Intermediate schools (Years 7 & 8) are grouped with primary schools. However, some secondary schools include Years 7 & 8 and this data is included in the secondary school findings. Composite schools, which offer a range of years from 0-12, are grouped with the secondary school findings.
Safety blocks	N4L blocks websites that are unsafe to students and includes content like pornography and graphic violence. These are called safety blocks. **The list of safety block categories includes:** Alcohol, child abuse, dating, discrimination, drug abuse, explicit violence, extremist groups, gambling, hacking, illegal or unethical, lingerie and swimsuit, marijuana, nudity and risque, other adult materials, plagiarism, pornography, proxy avoidance, tobacco and weapons (sales).
School rolls	Secondary schools generally have larger school rolls than primary schools. The average secondary school has 646 students, while the average primary school has 257 students.
Security blocks	N4L mitigates the impact of cyber threats, such as phishing scams, command and control servers and DDoS attacks. Malicious actors continue to find new vulnerabilities to exploit. ***Included under security blocks:*** Command and control servers, DNS exfiltration, dynamic DNS, Intrusion Prevention Service blocks (previously called unauthorised access attempts in the Term 2 report), malicious websites, malware, newly observed domains, newly registered domains, phishing attempts, spam URLs and viruses.
Website blocks	The total number of all websites blocked by N4L's filtering. This includes both safety blocks, which are explained above in this glossary, as well as websites blocked optionally by schools, such as games or social media. Not all schools will have the same websites blocked; it depends on the school's choice.

Āpitihanga | Appendix

Āpitihanga 1 | Appendix

Data use: consumption across school terms

Figure 1 - Total data consumed each school term

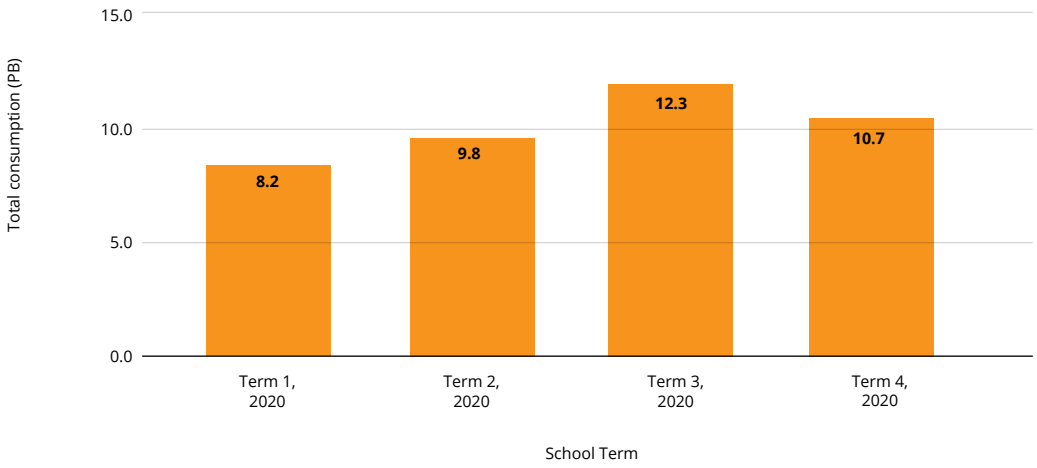
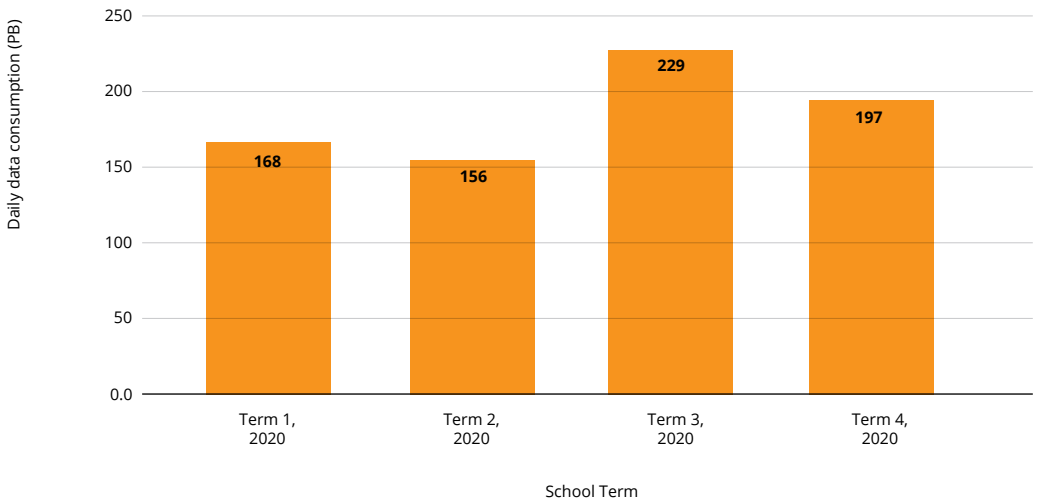


Figure 2 - Average daily data consumption across school terms



Āpitihanga 2 | Appendix

Data use: a closer look across the regions

Figure 3 - Percentage change in data use between the first and second half of the year by region

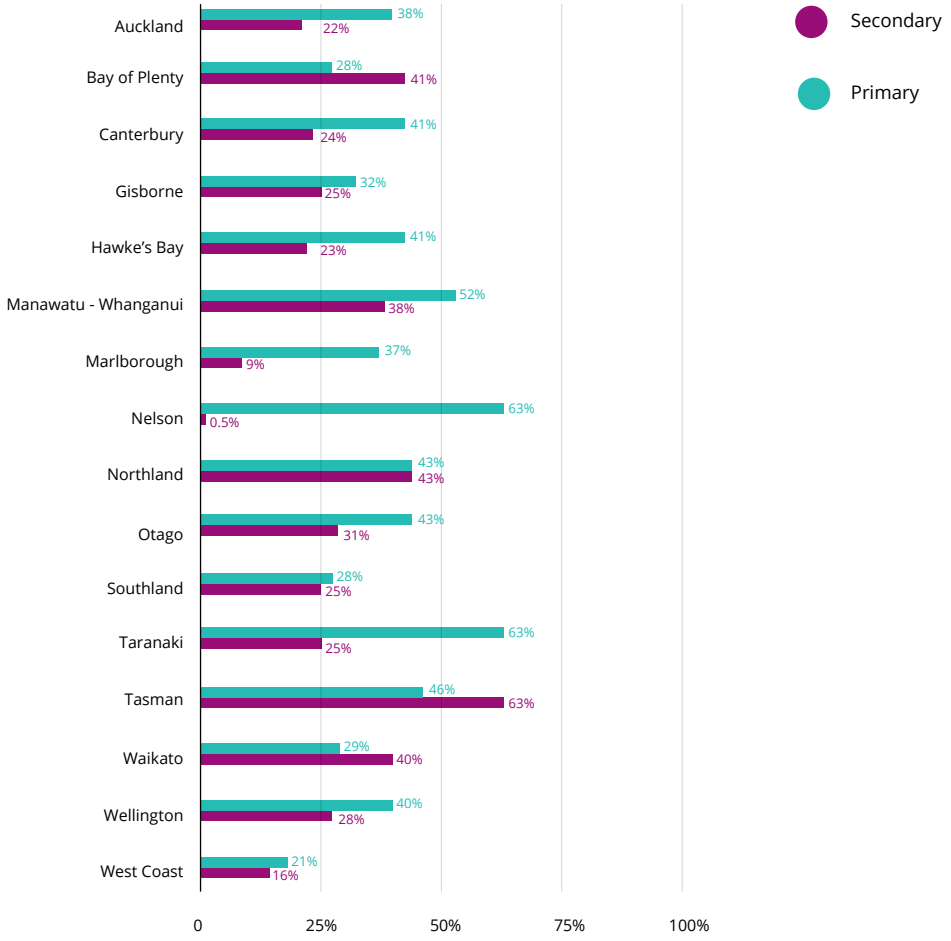
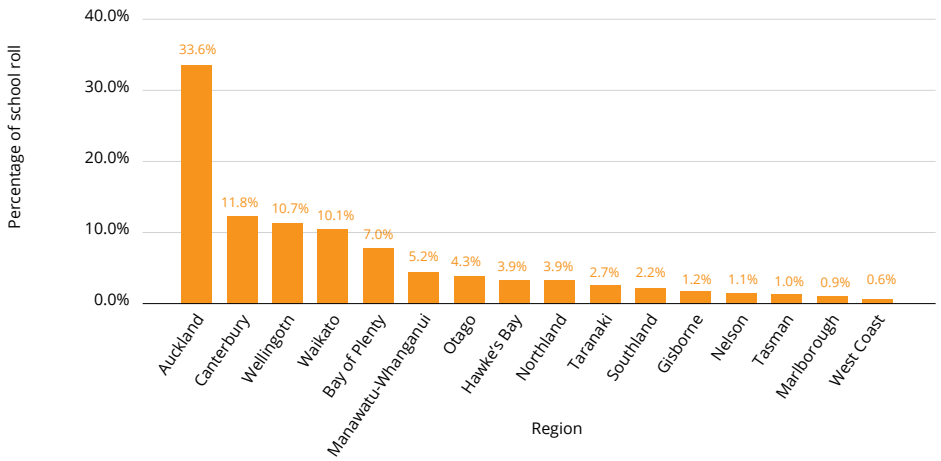


Figure 4 - The percentage of students in each region



Āpitihanga 3 | Appendix

Data use: browsing time on websites

Figure 5 - Top 30 education websites by browsing time for primary and secondary schools

Primary	%
Teacher Dashboard	39.1%
Seesaw	7.7%
eTap	7.1%
Epic	5.4%
Grammarly	4.0%
Prodigy Education	3.9%
Linc-Ed	3.8%
3P Learning	2.9%
G Suite for Education (Google)	2.8%
Kahoot	2.2%
Reading Eggs	2.2%
Class Dojo	1.9%
Texthelp	1.6%
school.nz	1.3%
Studyladder	1.1%
Lightspeed Mobile Device Management	1.1%
Massachusetts Institute of Technology	1.0%
MathsOnline	0.7%
Maths-Whizz	0.6%
Securly	0.6%
Matific	0.5%
Sumdog	0.5%
Edge Learning Solutions	0.4%
Book Creator	0.4%
Lexia Learning	0.3%
Language Perfect	0.3%
Education Perfect	0.3%
Reading Eggspress	0.3%
Write That Essay	0.2%
ReadTheory	0.2%

Secondary	%
Teacher Dashboard	33.4%
Grammarly	15.0%
G Suite for Education (Google)	11.6%
school.nz	5.2%
Texthelp	4.5%
Language Perfect	3.6%
Education Perfect	3.1%
Kahoot	2.2%
govt.nz	1.6%
Seesaw	1.5%
Lightspeed Mobile Device Management	1.3%
Matific	1.1%
Quizlet	1.1%
Edge Learning Solutions	0.9%
Prodigy Education	0.8%
PowerSchool	0.8%
Epic	0.7%
Instructure	0.6%
3P Learning	0.5%
Reading Eggs	0.5%
Class Dojo	0.4%
eTAP	0.4%
MathJax	0.4%
Massachusetts Institute of Technology	0.3%
Gamefroot	0.3%
Studyladder	0.3%
SchoolPoint	0.3%
Write That Essay	0.3%
MathsOnline	0.2%
Securly	0.2%

Figure 6 - Where primary school users spend their time across all websites.

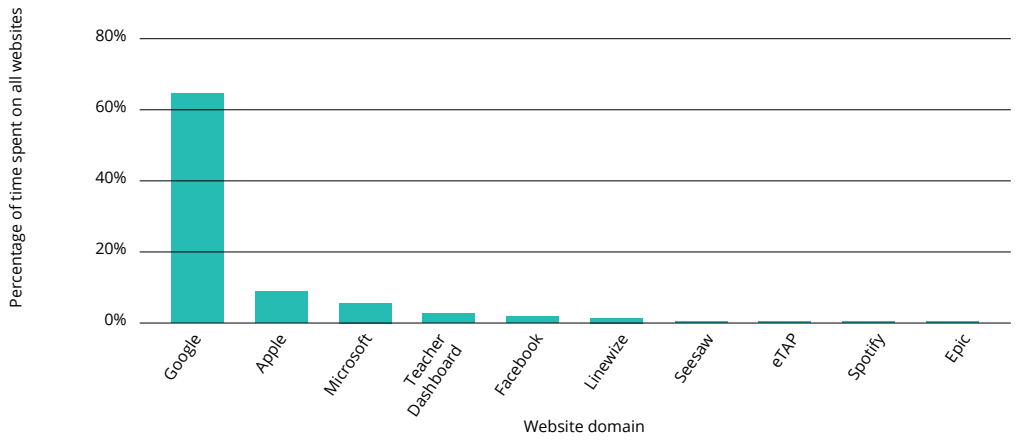
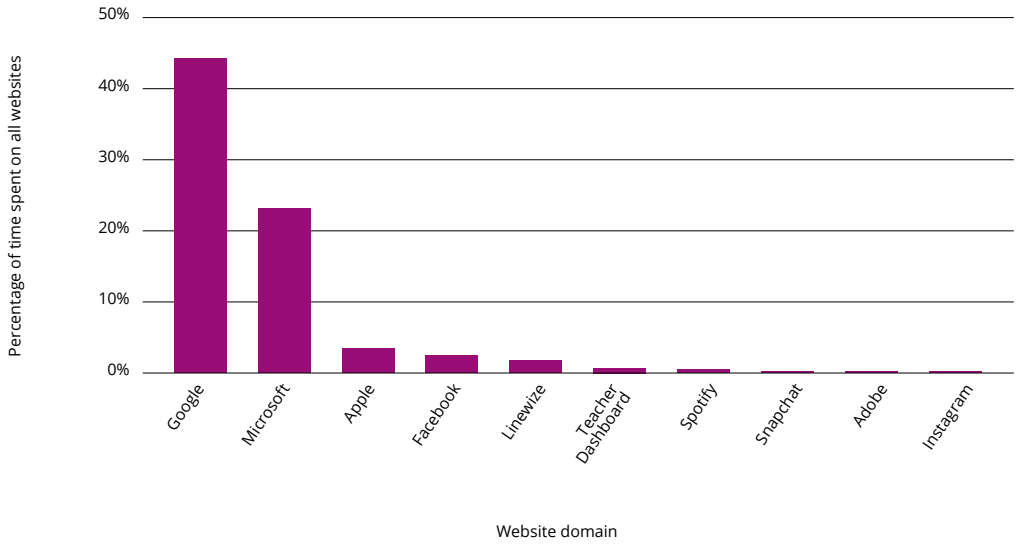


Figure 7 - Where secondary school users spend their time across all websites



Appendix | Āpitihanga 4

Protecting schools: safety and security blocks

Figure 8 - Security and safety blocks by school term

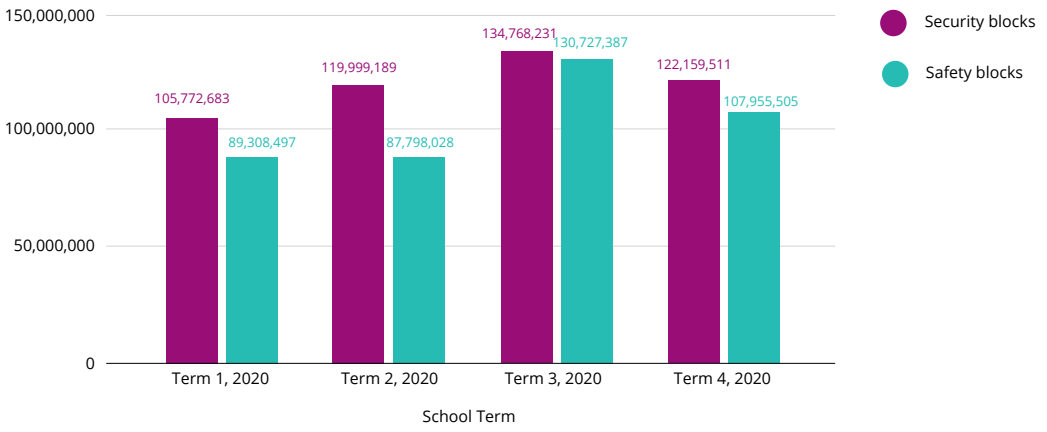


Figure 9 - The percentage change in blocked categories between first and second half of 2020

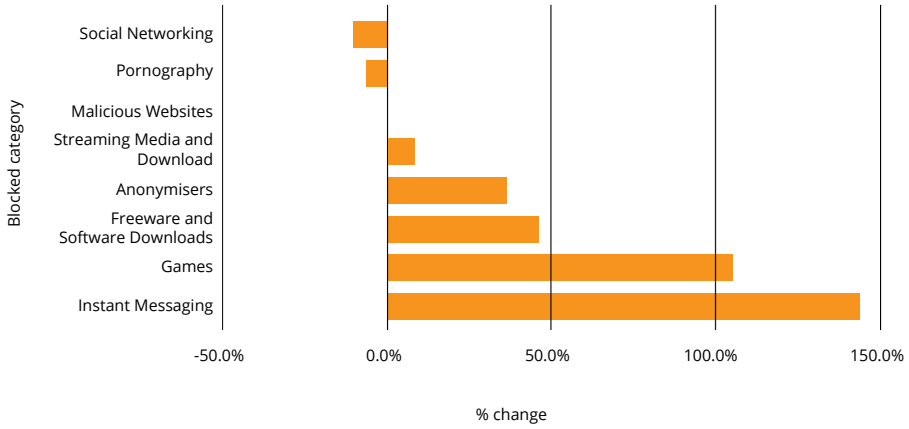


Figure 10 - Anonymiser blocks by school term

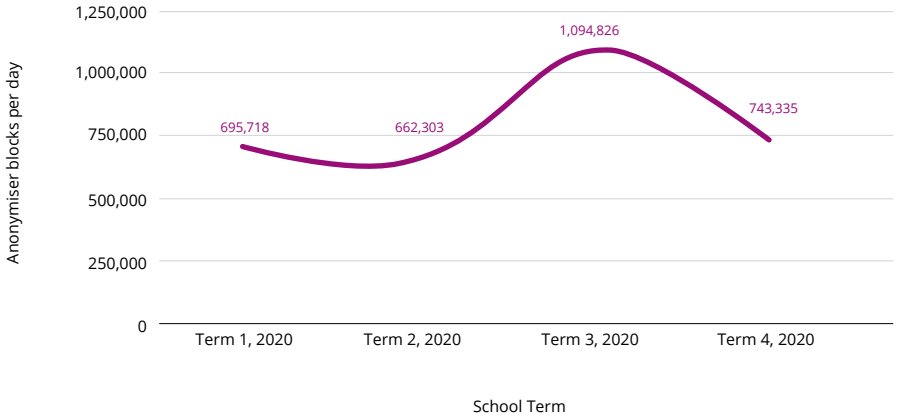
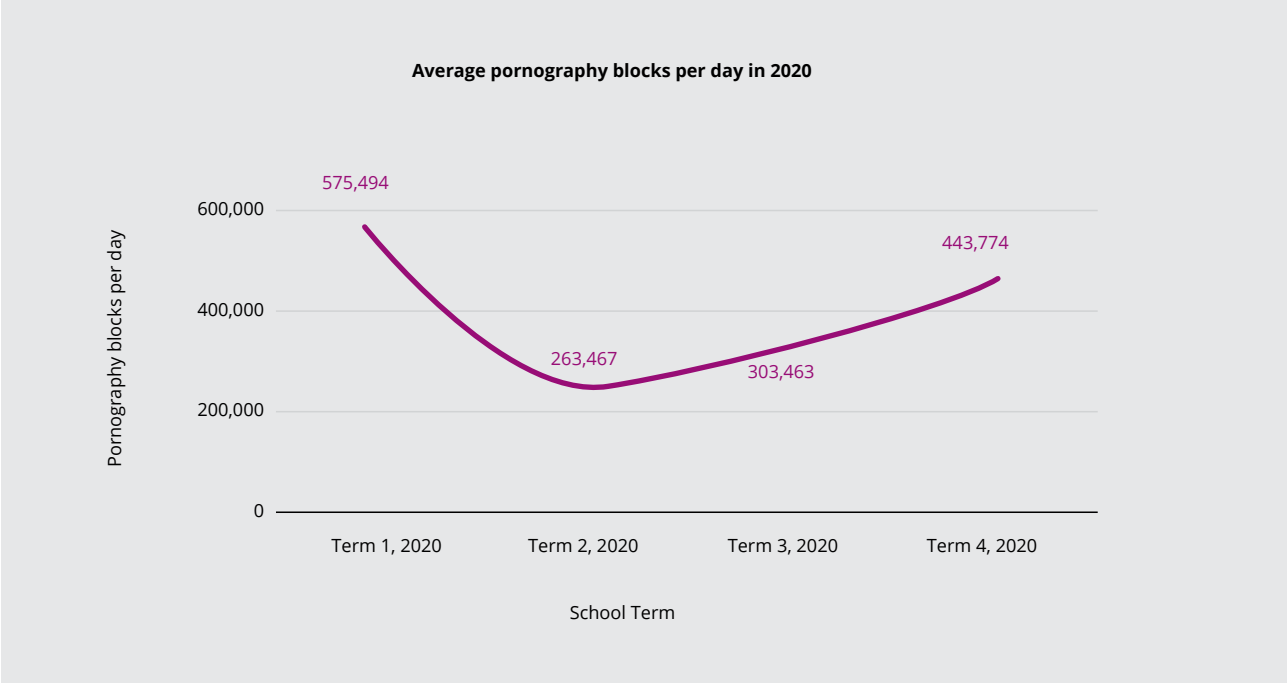


Figure 11 - Pornography blocks by school term



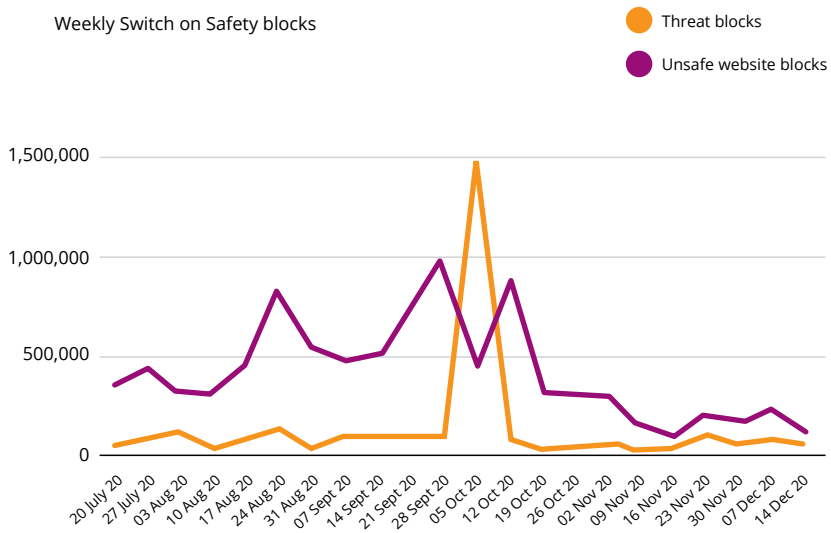
Appendix | Āpitihanga 5

Online safety filter: protecting students from home

Switch on Safety is a safety filter that parents can set up on their children's learning device to block the worst of the web. It is designed to make the internet safer for all students learning from home and is part of N4L's commitment to provide safer connectivity for learning while students are away from school. **During the second half of the year, 800 households used the filter each day, with more than 2.9 million online threats and 8.8 million unsafe websites blocked during this time.**

A spike in malware blocks was noted during the school holidays between the third and fourth school terms. This was caused by the adware tool 'cleverjumper', which generates pop-up ads on a user's device.

Figure 12 - Weekly Switch on Safety blocks over time



Blocked websites include those featuring pornography, gambling, cyber-bullying, plagiarism, self-harm and drug and alcohol content.

Websites associated with viruses, malware and scams, and anonymiser services, which can be used to defeat filters, are also blocked, along with other malicious software designed to infect devices and steal information.

Unlike the filtering at school, users can't add sites they want to block. However, N4L's filtering technology adds new unsafe websites automatically as they arise. You can find the full list of blocked categories at **switchonsafety.co.nz**.

Most commonly blocked Switch on Safety categories in the second half of the year