

Appendix C

Cognitive Interview Reports

For

Computer Familiarity Study



Computer/Technology Access and Familiarity Survey Cognitive Testing of the Survey Items Summary of Implementation

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INTRODUCTION

The National Center for Education Statistics (NCES) and the National Assessment Governing Board (NAGB) have announced that the National Assessment of Educational Progress (NAEP) will be a fully technology-based assessment by 2017. In order to track the extent to which students in different subgroups are ready to participate in technology-based assessments, the NAEP Validity Studies (NVS) Panel is conducting a special study that will develop survey-based measures of computer/technology access and familiarity. The survey items that will form the basis for these measures will be administered to a special study sample as part of the 2015 NAEP administration.¹

To inform the development of the draft survey items, NVS project staff conducted nine cognitive interviews with five fourth grade students and four eighth graders. This report summarizes the methodology of the cognitive testing of the draft survey items. The revisions to items made on the basis of the cognitive testing, as well as a concurrent review by members of NCES' Principals' Panel, are documented in the appendix. Dr. Bohrnstedt, the study Principal Investigator, led effort to revise the items.

RECRUITMENT

Recruitment for the cognitive interviews was conducted by a recruitment firm (Elliott Benson Research) in the Sacramento, CA area. Recruiters used a screening protocol to enlist a diverse sample of respondents. These protocols were created by NVS staff and approved by the American Institutes for Research (AIR) Institutional Review Board (IRB).

¹ Because the intention of the NVS study is to create cross-grade measures of access and familiarity, all of the items developed for the study are designed to be used across grades 4, 8, and 12. The sample of items included in the cognitive testing, and intended for the 2015 administration, also contains additional grade 8/12 items developed by ETS and intended for a broader NAEP survey module on technology.

Participation inclusion criteria were established to ensure that the participants would be balanced by gender, and would over-represent categories of respondents most likely to experience problems reading and interpreting survey items. Therefore, the recruiting firm was instructed to choose participants with the following characteristics:

- At least half of the sample at each grade level should meet at least one of the following criteria: be non-white, come from a home in which English is not the dominant language, and/or be of low socioeconomic status, as evidenced by eligibility for the free or reduced lunch program.
- Participants should be evenly distributed by gender
- Participants must be starting the 5th or 9th grade in the fall 2014.

PARTICIPANTS

A total of nine participants were recruited; five students who had just completed fourth grade and four who had just completed eighth grade. Table 1 provides information about the demographics of the nine cognitive testing participants.

All of the participants lived in the Sacramento area and all the cognitive interviews were conducted in downtown Sacramento. Eight of the participants were students at public schools and one fourth grader was a student at a charter school. The average age of the fourth grade participants was 10 years (range: 9-11) and the average age of the eighth grade students was 14 years (range: 13-14). There was a balanced representation of gender at both grade levels. One fourth grade participant was from a home where both English and Spanish was spoken. The remaining participants were from homes where the main language spoken was English (44%) or Spanish (44%). About half of the participants (56%) were eligible for free or reduced price lunch.

Table 1. Participant Characteristics

	Fourth Grade	Eighth Grade	TOTAL
Type of school			
Private	0	0	0
Public	4	4	8
Charter	1	0	1
Gender			
Female	2	2	4
Male	3	2	5
Main language spoken at home			
English	2	2	4
Spanish	2	2	4
English and Spanish	1	0	1
Race/Ethnicity			
American Indian/Alaska Native	0	1	1
African American/Black	0	0	0
Asian/Pacific Islander	0	0	0
Hispanic or Latino	4	2	6
White	0	1	1
Asian and White	1	0	1
Eligible for free or reduced-price lunch	2	3	5

PROCEDURES

The cognitive interviews were held from June 24 to July 7, 2014. Each cognitive interview lasted approximately 90 minutes and students received a \$100 gift card for their participation. All cognitive interviews were audio-recorded.

Parental Consent. Parental consent was obtained before each interview. The consent form outlined the purpose of and procedures involved in the research, risks and benefits, issues related to confidentiality, whom to contact with questions and concerns, and the voluntary nature of participation. The form also gave permission to audio-record the interview.

Survey and Protocol. A trained cognitive interviewer administered the draft survey and conducted each interview using a protocol that included structured probes to check for understanding. The cognitive interview protocol was developed by NVS staff. All materials were approved by AIR's IRB. Two versions of the survey with alternative item orderings were tested at each grade level to ensure that data would be obtained for all of the survey items.

Cognitive Interview Sessions. An interviewer sat with the participant throughout the duration of the session. Using the protocol as a guide, the interviewer introduced the participant to the survey and testing procedures, guided them through the cognitive interview process, and queried them about individual survey items. After being provided with a summary of participant rights and completing the assent form, participants were oriented to aspects of their surroundings that were outlined in the assent form (e.g., audio-recording equipment), as well as key features of the

interview process. In particular, participants were told that they would be asked to complete a survey and to “think aloud” while doing so. That is, participants were told that they should verbalize their thoughts as they read and answered each individual item. Next, the interviewer conducted an exercise to train participants in thinking out loud, by first modeling this behavior and then asking them to complete a practice task. After confirming that the participant was able to effectively think out loud, the interviewer introduced pictures of a desktop computer, a laptop computer, a smartphone, and a tablet computer in order to familiarize participants with the electronic devices mentioned in the survey items. Finally, participants read and answered each survey question while thinking aloud. Interviewers queried participants during this process using both scripted and unscripted concurrent probes.

The interviewer took notes during the interview session. In addition, the interviews were audio-recorded and these recordings were used for reference to supplement and refine the notes taken in real time.

ANALYSIS OF FINDINGS

After each cognitive interview was completed, the open-ended interview responses were compiled into an Excel file organized by survey question. Information on the extent to which the script for presenting pictures of devices was successful in orienting students to the types of devices they would encounter in the survey was also summarized. Finally, the survey findings were examined by the study principal investigator in conjunction with findings from a concurrent review by NCEES’ Principals’ Panel, and all revisions to the survey items and administration script were entered into an Excel file along with rationales for the revisions. This Excel file is included as an appendix to this report.

Item	Original Grade 4 item number	Original Grade 8/12 item number	Original question	Revised question	Rationale
Administration directions			<p><i>Now you are going to answer some questions about computers and similar devices. Before we start, I am going to show you pictures of each of these devices so that you will know exactly what the questions are about.</i></p> <p>Show picture of desktop computer. Say: <i>This is a desktop computer.</i></p> <p>Show picture of laptop computer. Say: <i>This is a laptop computer.</i></p> <p>Show picture of smartphone. Say: <i>This is a smartphone.</i></p> <p>Show picture of tablet computer. Say: <i>This is a tablet computer.</i></p>	<p><i>Now you are going to answer some questions about computers and similar devices. Before we start, I am going to show you examples of each of these devices so that you will know exactly what the questions are about.</i></p> <p>Show picture of desktop computer. Say: <i>This is an example of a desktop computer.</i></p> <p>Show picture of laptop computer. Say: <i>This is an example of a laptop computer.</i></p> <p>Show picture of smartphone. Say: <i>This is an example of a smartphone. A smartphone is any phone that is able to connect to the Internet. Besides making phone calls and taking pictures, smartphones allow you to do many of the same things as a desktop or laptop computer.</i></p> <p>Show picture of tablet. Say: <i>This is an example of a tablet. A tablet is bigger than a smartphone. It allows you to do many of the same things as a smartphone, but it doesn't make phone calls. If you use a tablet at school, you might also do some things that you probably wouldn't do with a smartphone. For example, you might read books or practice math problems.</i></p>	Many students had difficulty generalizing from the device pictures, especially generalizing to Apple products (iPhone and iPad). New directions are intended to convey that there are a range of devices with similar functionality.
Global change			"tablet computer"	"tablet"	Students uniformly reported that this is what they would call the pictured device.
VH155319		1	<p>How much do you know about computers?</p> <p>A I hardly know anything at all B I know a little bit C I know something D I know quite a bit E I know a lot</p>	<p>How much do you know about using computers?</p> <p>A I hardly know anything at all. B I know something. C I know quite a bit. D I know a lot.</p>	Some grade 8 cog lab subjects, as well as students in a focus group lead by one of the principals, were unsure how to interpret "know about computers." Some thought it meant knowledge of how computers function, and therefore rated themselves low, while our intent was only to determine how knowledgeable they felt about using computers. Also eliminated response option B because two of the principals pointed out that there was a lack of distinction among the first three response options.
VH166527		2	<p>At home, do you have a laptop or desktop computer that is only for your use?</p> <p>A Yes B No</p>		No change

VH166529	3	At home, do you have a laptop or desktop computer that you share with others? A Yes B No	At home, is there a laptop or desktop computer that is shared between you and others? A Yes B No	Gade 4 students interpreted this as personally having a device that they were willing to share with others.
VH166524	4	At home, do you have a tablet computer that is only for your use? A Yes B No	At home, do you have a tablet that is only for your use? A Yes B No	Reflects global change.
VH166526	5	At home, do you have a tablet computer that you share with others? A Yes B No	At home, is there a tablet that is shared between you and others? A Yes B No	See rationale for Grade 4, Q 3. Also reflects global change.
VH166530	6	At home, do you have Wi-Fi or some other Internet connection you can use? A Yes B No		No change
VH166531	7	7 At home, do you have a smartphone that is only for your use? A Yes B No		No change
VH155275		2 At home, do you have any of the following? Fill in one oval on each line. Yes No		No change
VH155283		2a a. A laptop or desktop computer that is only for your use A B		No change

VH155284			2b. A laptop or desktop computer that you share with others A B	b. A laptop or desktop computer that is shared between you and others A B	See rationale for Grade 4, Q 3.
VH155280			2c. A tablet computer that is only for your use A B	c. A tablet that is only for your use A B	Reflects global change.
VH155281			2d. A tablet computer that you share with others A B	d. A tablet that is shared between you and others A B	See rationale for Grade 4, Q 3. Also reflects global change.
VH155285			2e. Wi-Fi or some other Internet connection you can use A B		No change
VH155287			2f. A smartphone that is only for your use A B		No change
VH155330	8		3 When you are at school, about how many hours a day do you use a laptop or desktop computer for doing schoolwork? A None B Less than an hour C About an hour D 2 to 3 hours E 3 to 4 hours F More than 4 hours	On a weekday, about how many hours do you use a laptop or desktop computer for doing schoolwork, including homework? A None B Less than an hour C About an hour D 2 to 3 hours E 3 to 4 hours F More than 4 hours	Students had several problems with this series of questions about time spent in school and "when you are not in school." They tended to miss the restriction to "at school" in the first question, to interpret "not at school" as meaning periods of time when school is not in session (e.g., spring break), and they sometimes estimated hours per week rather than hours per day. They also were somewhat uncertain about the distinction between "school work" and "homework." Consequently, we have removed the distinction between school and non-school time spent, asked for hours in one day
VH155332	9		4 When you are at school, about how many hours a day do you use a tablet computer for doing schoolwork? A None B Less than an hour C About an hour D 2 to 3 hours E 3 to 4 hours F More than 4 hours	On a weekday, about how many hours do you use a tablet for doing schoolwork, including homework? A None B Less than an hour C About an hour D 2 to 3 hours E 3 to 4 hours F More than 4 hours	See rationale for Grade 4, item 8/Grade 8, item 4. Also reflects global change.
VH155323	10		5 During the week, when you are not at school, about how many hours a day do you use a laptop or desktop computer for doing homework? A None B Less than an hour C About an hour D 2 to 3 hours E 3 to 4 hours F More than 4 hours	DELETED	See rationale for Grade 4, item 8/Grade 8, item 4

VH155326	11	6	During the week, when you are not at school, about how many hours a day do you use a tablet computer for doing homework? A None B Less than an hour C About an hour D 2 to 3 hours E 3 to 4 hours F More than 4 hours	DELETED	See rationale for Grade 4, item 8/Grade 8, item 4
VH156034	12		When did you first use a laptop or desktop computer? A I have never used one. B Before I was in kindergarten C When I was in kindergarten D When I was in first, second, or third grade E When I was in fourth grade	No change to text of item, but this series of questions moved to follow Grade 4, item 7	Some students appeared to be responding with when they first used a laptop or desktop computer for school. Move places the items ahead of the questions about school use and should broaden their context.
VH156037	13		When did you first use a tablet computer? A I have never used one. B Before I was in kindergarten C When I was in kindergarten D When I was in first, second, or third grade E When I was in fourth grade	When did you first use a tablet? A I have never used one. B Before I was in kindergarten C When I was in kindergarten D When I was in first, second, or third grade E When I was in fourth grade This series of items moved to follow Grade 4, item 7	Reflects global change. Also see rationale for Grade 4, item 12
VH156042	14		When did you first use a smartphone? A I have never used one. B Before I was in kindergarten C When I was in kindergarten D When I was in first, second, or third grade E When I was in fourth grade	No change to text of item, but this series of questions moved to follow Grade 4, item 7	See rationale for Grade 4, item 12
VH155872		7 (grade 8 only)	When did you first use a laptop or desktop computer? A I have never used one. B Before I was in kindergarten C When I was in kindergarten D When I was in first, second, or third grade E When I was in fourth or fifth grade F When I was in sixth, seventh, or eighth grade	No change to text of item, but this series of questions moved to follow Grade 8 item 2	See rationale for Grade 4, item 12
VH155875		8 (grade 8 only)	When did you first use a tablet computer? A I have never used one. B Before I was in kindergarten C When I was in kindergarten D When I was in first, second, or third grade E When I was in fourth or fifth grade F When I was in sixth, seventh, or eighth grade	When did you first use a tablet? A I have never used one. B Before I was in kindergarten C When I was in kindergarten D When I was in first, second, or third grade E When I was in fourth or fifth grade F When I was in sixth, seventh, or eighth grade This series of items moved to follow Grade 8, item 2	Reflects global change. Also see rationale for Grade 4, item 12

VH155882		9 (Grade 8 only)	When did you first use a smartphone? A I have never used one. B Before I was in kindergarten C When I was in kindergarten D When I was in first, second, or third grade E When I was in fourth or fifth grade F When I was in sixth, seventh, or eighth grade	No change to text of item, but this series of questions moved to follow Grade 8, item 2	See rationale for Grade 4, item 12
VH155339		7 (grade 12 only)	When did you first use a laptop or desktop computer? A I have never used one. B Before I was in kindergarten C When I was in kindergarten D When I was in first, second, or third grade E When I was in fourth or fifth grade F When I was in sixth, seventh, or eighth grade G When I was in high school	No change to text of item, but this series of questions moved to follow Grade 12 item 2	See rationale for Grade 4, item 12
VH155345		8 (grade 12 only)	When did you first use a tablet computer? A I have never used one. B Before I was in kindergarten C When I was in kindergarten D When I was in first, second, or third grade E When I was in fourth or fifth grade F When I was in sixth, seventh, or eighth grade G When I was in high school	When did you first use a tablet? A I have never used one. B Before I was in kindergarten C When I was in kindergarten D When I was in first, second, or third grade E When I was in fourth or fifth grade F When I was in sixth, seventh, or eighth grade G When I was in high school This series of items moved to follow Grade 12, item 2	Reflects global change. Also see rationale for Grade 4, item 12
VH155351		9 (Grade 12 only)	When did you first use a smartphone? A I have never used one. B Before I was in kindergarten C When I was in kindergarten D When I was in first, second, or third grade E When I was in fourth or fifth grade F When I was in sixth, seventh, or eighth grade G When I was in high school	No change to text of item, but this series of questions moved to follow Grade 8, item 2	See rationale for Grade 4, item 12
VH176734	15		At school, were you taught how to type on a computer keyboard using the correct fingers? A Yes B No		No change
VH176739	16		At school, were you taught how to write sentences and paragraphs using a computer? A Yes B No		No change
VH176741	17		At school, were you taught how to edit and format text using a computer? A Yes B No	At school, were you taught how to edit text using a computer? A Yes B No	Students at both grade levels misinterpreted the meaning of "format text." They thought it meant giving a story or essay the correct structure (e.g., having topic sentences in paragraphs).
VH176742	18		At school, were you taught how to search for information on the Internet? A Yes B No		No change

VH176745	19		At school, were you taught how to use a tablet computer? A Yes B No	At school, were you taught how to use a tablet? A Yes B No	Reflects global change
VH176748	20		At school, were you taught how to draw a picture using a computer? A Yes B No		No change
VH176750	21		At school, were you taught how to look up the meaning of a word using a computer? A Yes B No		No change
VH155373		10	Were you taught any of the following at school? Fill in one oval on each line. Yes No		No change
VH155375		10a	a. How to type on a computer keyboard using the correct fingers A B		No change
VH155376		10b	b. How to write sentences and paragraphs using a computer A B		No change
VH176918		10c	c. How to edit and format text using a computer A B	c. How to edit text using a computer A B	See rationale for Grade 4, item 17
VH155377		10d	d. How to search for information on the Internet A B		No change
VH155378		10e	e. How to use a tablet computer A B	e. How to use a tablet A B	Reflects global change
VH155379		10f	f. How to draw a picture using a computer A B		No change
VH155380		10g	g. How to look up the meaning of a word using a computer A B		No change
VH155381		10h	h. How to create a spreadsheet using a computer A B		No change

VH155382			10i. How to create a presentation using digital media (for example, books, music, pictures, videos) A B	i. How to create a presentation using a computer A B	Some students didn't know what "digital media" meant. In addition the new wording is more consistent with the wording of other similar items.
VH155384			10j. How to run simulations using a computer A B		No change
VH155385			10k. How to write a computer program A B	k. How to write a computer program or app A B	Some students didn't know what a computer program was. "App" may be a more familiar term.
VH155386			10l. How to create a graph or chart using a computer A B		No change
VH155387			10m. How to maintain a website or blog A B		No change
VH155388			10n. How to install new software or apps A B		No change
			New item	o. How to troubleshoot problems with a computer A B	This item picks up an important skill that was missing from the previous set.
VH176753	22		At school, are there laptop or desktop computers that students can share? A Yes B No	At school, are there laptop or desktop computers that you can use for schoolwork? A Yes B No	Students did not understand a computer as being "only for their own use" if they had to turn it in at the end of the class period. Therefore we have simplified this series of questions to eliminate the distinction between sharing and not sharing. But we have also added two new questions about computers assigned to the student on a permanent basis. Finally, some students didn't know whether to count something (like
VH176757	23		At school, do you have a laptop or desktop computer that is only for your use? (This could be a computer that you bring from home or one that is assigned to you by your school.) A Yes B No	DELETED	See rationale for Grade 4, item 22.
VH176759	24		At school, are there tablet computers that students can share? A Yes B No	At school, are there tablets computers that you can use for schoolwork? A Yes B No	See rationale for Grade 4, item 22. Also reflects global change.
VH176769	25		At school, do you have a tablet computer that is only for your use? (This could be a tablet computer that you bring from home or one that is assigned to you by your school.) A Yes B No	DELETED	See rationale for Grade 4, item 22.

VH182302	26		At school, is there Wi-Fi or some other Internet connection you can use? A Yes B No	At school, is there Wi-Fi or some other Internet connection that you can use for schoolwork? A Yes B No	See rationale for Grade 4, item 22.
VH176772	27		Does your teacher use a computer when teaching your class? A Yes B No		No change
VH176773	28		Does your teacher require you to use computers in the classroom? A Yes B No		No change
VH155477			11 Which of the following are true about the ways in which you and your teachers use computers at school? Fill in one oval on each line. Yes No		No change
VH155479			11a a. In most of my classes there are laptop or desktop computers that students can share. A B	a. In most of my classes there are laptop or desktop computers that I can use for school work. A B	See rationale for Grade 4, item 22.
VH155480			11b b. In most of my classes I have a laptop or desktop computer that is only for my use. (This could be a computer that you bring from home or one that is assigned to you by your school.) A B	DELETED	See rationale for Grade 4, item 22.
VH155482			11c c. In most of my classes there are tablet computers that students can share. A B	c. In most of my classes there are tablets that I can use for schoolwork. A B	See rationale for Grade 4, item 22. Also reflects global change.
VH155483			11d d. In most of my classes I have a tablet computer that is only for my use. (This could be a tablet computer that you bring from home or one that is assigned to you by your school.) A B	DELETED	See rationale for Grade 4, item 22.
VH182383			11e e. There is Wi-Fi or some other Internet connection I can use. A B	e. There is Wi-Fi or some other Internet connection that I can use for schoolwork. A B	See rationale for Grade 4, item 22.
VH155484			11f f. Most of my teachers use computers when teaching my classes. A B		No change

VH155485		11g	g. Most of my teachers require us to use computers in the classroom. A B		No change
	New item	New item		Has your school assigned you a laptop or desktop computer that only you can use? A No B Yes, but I cannot take it home with me C Yes, and I can take it home with me	See rationale for Grade 4, item 22.
	New item	New item		Has your school assigned you a tablet that only you can use? A No B Yes, but I cannot take it home with me C Yes, and I can take it home with me	See rationale for Grade 4, item 22.
VH156075		29	This school year, how often have you used a laptop or desktop computer to write a short paper (less than a page) for school? A Never B A few times C Once every few weeks D 1-3 times a week E Every day or almost every day	This school year, how often have you used a laptop or desktop computer to write a short paper (less than a page) for school? A Never B A few times C Once every few weeks D About once a week E More than once a week	Results from the recently completed analysis of computer-related survey items in the TEL assessment indicated that the standard NAEP response options on frequency of use show a curvilinear relationship to achievement, with "everyday or almost everyday" chosen disproportionately by second language learners and students eligible for FRPL. This appears related to the fact that "everyday or almost everyday" is an implausible option for many of the types of activities surveyed.
VH156078		30	This school year, how often have you used a laptop or desktop computer to write a paper that was longer than a page for school? A Never B A few times C Once every few weeks D 1-3 times a week E Every day or almost every day	This school year, how often have you used a laptop or desktop computer to write a paper for school that was longer than a page? A Never B A few times C Once every few weeks D About once a week E More than once a week	One of the principals pointed out that the revised wording of the stem would be more grammatical. With regard to the changes to response options, see rationale for Grade 4, item 29.
VH156081		31	This school year, how often have you used a laptop or desktop computer to search the Internet for a school project? A Never B A few times C Once every few weeks D 1-3 times a week E Every day or almost every day	This school year, how often have you used a laptop or desktop computer to search the Internet for a school project? A Never B A few times C Once every few weeks D About once a week E More than once a week	See rationale for Grade 4, item 29.
VH156082		32	This school year, how often have you used a laptop or desktop computer to help you learn things in mathematics that you were having trouble with? A Never B A few times C Once every few weeks D 1-3 times a week E Every day or almost every day	This school year, how often have you used a laptop or desktop computer to practice things in mathematics that you were having trouble learning? A Never B A few times C Once every few weeks D About once a week E More than once a week	The original question was not picking up remedial practice, as had been our intention. Rather, students were reporting querying Google or going to math websites to get explanations, etc. With regard to the changes to response options, see rationale for Grade 4, item 29.

VH176775	33		This school year, how often have you used a laptop or desktop computer to help you learn things in reading that you were having trouble with? A Never B A few times C Once every few weeks D 1-3 times a week E Every day or almost every day	This school year, how often have you used a laptop or desktop computer to practice things in reading that you were having trouble learning? A Never B A few times C Once every few weeks D About once a week E More than once a week	See rationales for Grade 4, item 32 and Grade 4, item 29.
VH177580	34		This school year, how often have you used a laptop or desktop computer to take a test? A Never B A few times C Once every few weeks D 1-3 times a week E Every day or almost every day	This school year, how often have you used a laptop or desktop computer to take a test? A Never B A few times C Once every few weeks D About once a week E More than once a week	See rationale for Grade 4, item 29.
VH155495		12	This school year, how often have you used a laptop or desktop computer to do each of the following? Fill in one oval on each line. Never A few times Once every few weeks 1-3 times a week Every day or almost every day	This school year, how often have you used a laptop or desktop computer to do each of the following? Fill in one oval on each line. Never A few times Once every few weeks About once a week More than once a week	See rationale for Grade 4, item 29.
VH155496		12a	a. Write a short paper (less than a page) for school ABCDE		No change
VH155497		12b	b. Write a paper that was longer than a page for school ABCDE	b. Write a paper for school that was longer than a page ABCDE	See rationale for Grade 4, item 30.
VH155498		12c	c. Search the Internet for a school project ABCDE		No change
VH176943		12d	d. Help you learn things in mathematics that you were having trouble with ABCDE	d. Practice things in mathematics that you were having trouble learning ABCDE	See rationale for Grade 4, item 32.
VH176945		12e	e. Help you learn things in reading that you were having trouble with ABCDE	e. Practice things in reading that you were having trouble learning ABCDE	See rationale for Grade 4, item 32.
VH176946		12f	f. Take a test ABCDE		No change
VH156083	35		This school year, how often have you used a tablet computer to write a short paper (less than a page) for school? A Never B A few times C Once every few weeks D 1-3 times a week E Every day or almost every day	This school year, how often have you used a tablet to write a short paper (less than a page) for school? A Never B A few times C Once every few weeks D About once a week E More than once a week	See rationale for Grade 4, item 29. Also reflects global change

VH156086	36		<p>This school year, how often have you used a tablet computer to write a paper that was longer than a page for school?</p> <p>A Never B A few times C Once every few weeks D 1-3 times a week E Every day or almost every day</p>	<p>This school year, how often have you used a tablet to write a paper for school that was longer than a page?</p> <p>A Never B A few times C Once every few weeks D About once a week E More than once a week</p>	<p>See rationales for Grade 4, item 30 and Grade 4, item 29. Also reflects global change.</p>
VH156087	37		<p>This school year, how often have you used a tablet computer to search the Internet for a school project?</p> <p>A Never B A few times C Once every few weeks D 1-3 times a week E Every day or almost every day</p>	<p>This school year, how often have you used a tablet to search the Internet for a school project?</p> <p>A Never B A few times C Once every few weeks D About once a week E More than once a week</p>	<p>See rationale for Grade 4, item 29. Also reflects global change</p>
VH156092	38		<p>This school year, how often have you used a tablet computer to help you learn things in mathematics that you were having trouble with?</p> <p>A Never B A few times C Once every few weeks D 1-3 times a week E Every day or almost every day</p>	<p>This school year, how often have you used a tablet to practice things in mathematics that you were having trouble learning?</p> <p>A Never B A few times C Once every few weeks D About once a week E More than once a week</p>	<p>See rationales for Grade 4, item 32 and Grade 4, item 29. Also reflects global change.</p>
VH176785	39		<p>This school year, how often have you used a tablet computer to help you learn things in reading that you were having trouble with?</p> <p>A Never B A few times C Once every few weeks D 1-3 times a week E Every day or almost every day</p>	<p>This school year, how often have you used a tablet to practice things in reading that you were having trouble learning?</p> <p>A Never B A few times C Once every few weeks D About once a week E More than once a week</p>	<p>See rationales for Grade 4, item 32 and Grade 4, item 29. Also reflects global change.</p>
VH177588	40	23	<p>This school year, how often have you used a tablet computer to take a test?</p> <p>A Never B A few times C Once every few weeks D 1-3 times a week E Every day or almost every day</p>	<p>This school year, how often have you used a tablet to take a test?</p> <p>A Never B A few times C Once every few weeks D About once a week E More than once a week</p>	<p>See rationale for Grade 4, item 29. Also reflects global change</p>
VH155524		13	<p>This school year, how often have you used a tablet computer to do each of the following? Fill in one oval on each line.</p> <p>Never A few times Once every few weeks 1-3 times a week Every day or almost every day</p>	<p>This school year, how often have you used a tablet to do each of the following? Fill in one oval on each line.</p> <p>Never A few times Once every few weeks About once a week More than once a week</p>	<p>See rationale for Grade 4, item 29. Also reflects global change</p>
VH155525		13a	<p>a. Write a short paper (less than a page) for school</p> <p>ABCDE</p>		<p>No change</p>

VH155528		13b	b. Write a paper that was longer than a page for school ABCDE	b. Write a paper for school that was longer than a page ABCDE	See rationale for Grade 4, item 30.
VH155527		13c	c. Search the Internet for a school project ABCDE		No change
VH176938		13d	d. Help you learn things in mathematics that you were having trouble with ABCDE	d. Practice things in mathematics that you were having trouble learning ABCDE	See rationale for Grade 4, item 32.
VH176925		13e	e. Help you learn things in reading that you were having trouble with ABCDE	e. Practice things in reading that you were having trouble learning ABCDE	See rationale for Grade 4, item 32.
VH176927		13f	f. Take a test ABCDE		No change
VH155541	41	14	Which best describes the way you type on a computer keyboard? A I don't know how to type using a computer keyboard. B I can type with one or two fingers but I have to search for where the letter keys are. C I can type with one or two fingers and I know where most of the letter keys are. D I can type with all ten fingers when I look at the keyboard. E I can type with all ten fingers without looking at the keyboard.	Which best describes the way you type on a computer keyboard? A I don't know how to type using a computer keyboard. B I can type with one or two fingers, but I have to search for where the letter keys are. C I can type with one or two fingers and I know where most of the letter keys are. D I can type with all ten fingers when I look at the keyboard. E I can type with all ten fingers without looking at the keyboard.	Fixed punctuation
VH155884	42	15	Compared to other students in your English/language arts class, how fast do you type on a computer keyboard? A I am among the slowest. B I am slower than most students. C I type about the same speed as others. D I am faster than most students. E I am among the fastest. F I don't know.	Compared to other students in your English/language arts class, how fast do you type on a computer keyboard? A I am slower than most students. B I type about the same speed as others. C I am faster than most students. D I don't know.	At the suggestion of principals, reduced the number of options.
VH176951	43	16	Would you rather take a test at school using paper and pencil or using a computer? A Paper and pencil B Computer		No change
VH155750		17	How familiar are you with each of the following? Fill in one oval on each line. Never heard of it Heard of it once or twice Heard of it a few times Heard of it often Know it well, understand the concept	How familiar are you with each of the following? Fill in one oval on each line. Never heard of it Heard of it once or twice Heard of it often Know it well, understand the concept	Principals noted that "heard of it once or twice" and "heard of it a few times" were not well differentiated.
VH155751		17a	a. E-reader ABCDE		No change

VH155752		17b	b. Wifi ABCDE		No change
VH155753		17c	c. Firewall ABCDE		No change
VH155754		17d	d. Axon router ABCDE	DELETED	One student answered on the basis of his knowledge of routers, noting in his comments that he didn't know what an "Axon router" was, but assumed it was a type of router. Therefore, the item does not seem to be functioning
VH155756		17e	e. Hyperlink ABCDE		No change
VH155757		17f	f. Neuro-digital computing ABCDE		No change
VH155758		17g	g. Instant Messenger ABCDE		No change
VH155759		17h	h. Central processing unit ABCDE		No change
VH155760		17i	i. Track changes ABCDE		No change
VH155761		17j	j. Cut and paste ABCDE		No change
VH155762		17k	k. Pyramidal browser ABCDE		No change
VH155763		17l	l. Pivot table ABCDE		No change
VH155765		17m	m. Spreadsheet ABCDE		No change
VH155766		17n	n. Limbic wire ABCDE		No change
VH155767		17o	o. Spinalbyte ABCDE		No change
VH155768		17p	p. Cloud computing ABCDE		No change
VH155769		17q	q. Server ABCDE		No change
VH155770		17r	r. Root directory ABCDE		No change
VH155771		17s	s. Compiler ABCDE		No change

VH155772		17t	t. ASCII ABCDE		No change
VH155779		17u	u. Callosum board ABCDE		No change
VH176789	44		Do you think you would be able to write sentences and paragraphs using a computer? A I definitely can't B I probably can't C Maybe D I probably can E I definitely can	Do you think you would be able to write sentences and paragraphs using a computer? A I definitely can't. B I probably can't. C I probably can. D I definitely can.	Removed "maybe" option at suggestion of principal. Forces choice to negative or positive. Also corrected punctuation.
VH176787	45		Do you think you would be able to edit and format text using a computer? A I definitely can't B I probably can't C Maybe D I probably can E I definitely can	Do you think you would be able to edit text using a computer? A I definitely can't. B I probably can't. C I probably can. D I definitely can.	See rationale for Grade 4, item 44. Also corrected punctuation.
VH176790	46		Do you think you would be able to use a touchscreen on a computer, tablet computer, or smartphone? A I definitely can't B I probably can't C Maybe D I probably can E I definitely can	Do you think you would be able to use a touchscreen on a computer, tablet, or smartphone? A I definitely can't. B I probably can't. C I probably can. D I definitely can.	See rationale for Grade 4, item 44. Also reflects global change and correction to punctuation.
VH176792	47		Do you think you would be able to look up a word in a dictionary using a computer? A I definitely can't B I probably can't C Maybe D I probably can E I definitely can	Do you think you would be able to look up the meaning of a word using a computer? A I definitely can't. B I probably can't. C I probably can. D I definitely can.	See rationale for Grade 4, item 44. Also changed stem to parallel Grade 4, item 21. Also corrected punctuation.
VH176793	48		Do you think you would be able to draw a picture using a computer? A I definitely can't B I probably can't C Maybe D I probably can E I definitely can	Do you think you would be able to draw a picture using a computer? A I definitely can't. B I probably can't. C I probably can. D I definitely can.	See rationale for Grade 4, item 44. Also corrected punctuation.
VH155799		18	18. Do you think you would be able to do each of the following? Fill in one oval on each line. I definitely can't I probably can't Maybe I probably can I definitely can	18. Do you think you would be able to do each of the following? Fill in one oval on each line. I definitely can't I probably can't I probably can I definitely can	See rationale for Grade 4, item 44.
VH176967		18a	a. Write sentences and paragraphs using a computer ABCDE		No change

VH155803		18b	b. Edit and format text using a computer ABCDE	b. Edit text using a computer ABCD	See rationale for Grade 4, item 17.
VH176970		18c	c. Use a touchscreen on a computer, tablet computer, or smartphone ABCDE	c. Use a touchscreen on a computer, tablet, or smartphone ABCD	Reflects global change.
VH155810		18d	d. Look up a word in a dictionary using a computer ABCDE	d. Look up the meaning of a word using a computer ABCD	Changed to parallel Grade 8, item 10g.
VH155811		18e	e. Draw a picture using a computer ABCDE		No change
VH155800		18f	f. View or download digital media ABCDE		No change
VH155820		18g	g. Create a presentation using digital media ABCDE	g. Create a presentation using a computer ABCD	See rationale for Grade 8, item 10i.
VH155802		18h	h. Create a spreadsheet using a computer ABCDE		No change
VH155804		18i	i. Install new software or apps ABCDE		No change
VH155805		18j	j. Participate in online discussions, forums, social networking sites, or virtual communities ABCDE		No change
VH155806		18k	k. Maintain a Website or blog ABCDE		No change
VH155807		18l	l. Search for information on the Internet ABCDE		No change
VH155808		18m	m. Run simulations using a computer ABCDE		No change
VH155809		18n	n. Create a graph or chart using a computer ABCDE		No change
VH155812		18o	o. Write a computer program ABCDE	o. Write a computer program or app ABCD	See rationale for Grade 8, item 10k.
		New item		p. Troubleshoot a problem with a computer ABCD	This item picks up an important skill that was missing from the previous set.
VH155876		19	On a scale from 0-10 where zero is not at all familiar and 10 is very familiar, how familiar with computers and digital technology are you? A 0, B 1, C 2, D 3, E 4, F 5, G 6, H 7, I 8, J 9, K 10		No change
VH155957			Please read the descriptions of the following four eighth grade students. After you read each description you will be asked to answer a question about each student based on the information provided.		No change

VH155958		20	<p>Linda often uses apps to talk to her friends or to play games. She does some of her homework on her laptop and knows how to write and create tables using a computer. Linda cannot type with 10 fingers but is pretty fast with two fingers and mostly finds the right keys.</p> <p>On a scale from 0-10 where zero is not at all familiar and 10 is very familiar, how familiar with computers and digital technology do you think Linda is?</p> <p>A 0, B 1, C 2, D 3, E 4, F 5, G 6, H 7, I 8, J 9, K 10</p>		No change
VH155961		21	<p>Tom often uses apps to talk to his friends or to play games. He does most of his homework on a computer and knows how to write and format papers on a computer and how to create complex tables or charts. He also created a few presentations using a computer. Tom can type pretty accurately using ten fingers when looking at the computer keyboard.</p> <p>On a scale from 0-10 where zero is not at all familiar and 10 is very familiar, how familiar with computers and digital technology do you think Tom is?</p> <p>A 0, B 1, C 2, D 3, E 4, F 5, G 6, H 7, I 8, J 9, K 10</p>	<p>Tom often uses apps to talk to his friends or to play games. He does most of his homework on a computer and knows how to write and edit papers on a computer and how to create complex tables or charts. He also created a few presentations using a computer. Tom can type pretty accurately using ten fingers when looking at the computer keyboard.</p> <p>On a scale from 0-10 where zero is not at all familiar and 10 is very familiar, how familiar with computers and digital technology do you think Tom is?</p> <p>A 0, B 1, C 2, D 3, E 4, F 5, G 6, H 7, I 8, J 9, K 10</p>	Change "formatting" to "editing." See rational for Grade 4, item 17.
VH155961		22	<p>Susan often uses apps on a smartphone or tablet and does most of her homework on a laptop. She is good at writing and formatting papers on her computer and has experience with creating complex tables and charts. Susan can type fast and accurately with 10 fingers without looking at the computer keyboard. She also knows a couple programming languages. This school year, she built her first own app.</p> <p>On a scale from 0-10 where zero is not at all familiar and 10 is very familiar, how familiar with computers and digital technology do you think Susan is?</p> <p>A 0, B 1, C 2, D 3, E 4, F 5, G 6, H 7, I 8, J 9, K 10</p>	<p>Susan often uses apps on a smartphone or tablet and does most of her homework on a laptop. She is good at writing and editing papers on her computer and has experience with creating complex tables and charts. Susan can type fast and accurately with 10 fingers without looking at the computer keyboard. She also knows a couple programming languages. This school year, she built her first own app.</p> <p>On a scale from 0-10 where zero is not at all familiar and 10 is very familiar, how familiar with computers and digital technology do you think Susan is?</p> <p>A 0, B 1, C 2, D 3, E 4, F 5, G 6, H 7, I 8, J 9, K 10</p>	Change "formatting" to "editing." See rational for Grade 4, item 17.
VH155959		23	<p>Kevin sometimes plays games on his smartphone or a computer, but usually does not use a computer for his homework. He used a computer a couple of times to write a paper but never used a computer to create tables, charts, or presentations. Kevin can type with one or two fingers but has to search where the correct keys are on the computer keyboard.</p> <p>On a scale from 0-10 where zero is not at all familiar and 10 is very familiar, how familiar with computers and digital technology do you think Kevin is?</p> <p>A 0, B 1, C 2, D 3, E 4, F 5, G 6, H 7, I 8, J 9, K 10</p>		No change