What the Program for the International Assessment of Adult Competencies (PIAAC) can tell us about the digital skills of U.S. adults

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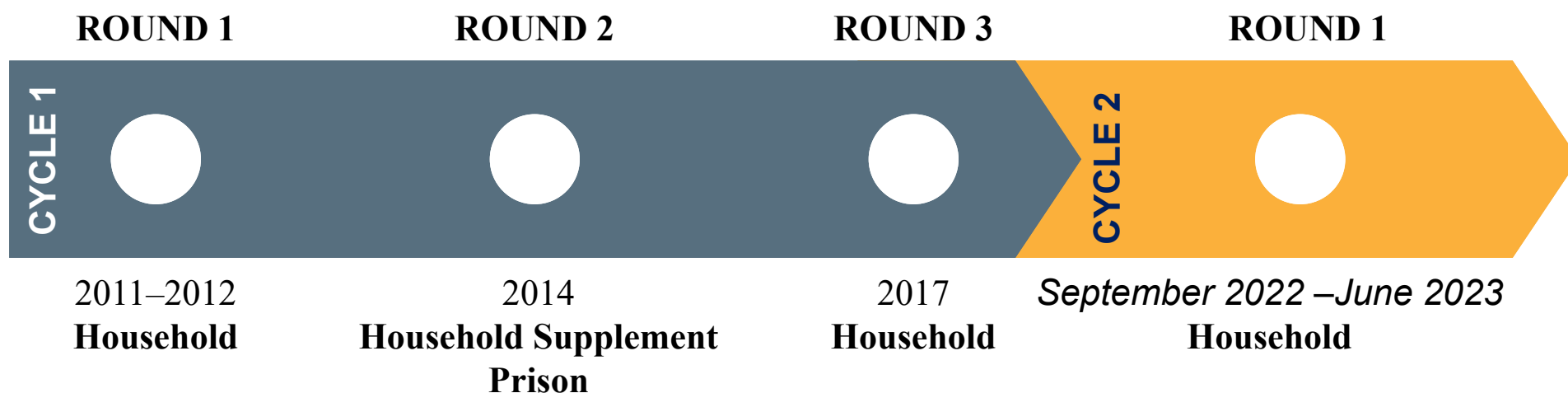Department of Education

October 10, 2024

Digital Inclusion Research Webinar

Evaluating Digital Skills: Data, Measurement Tools, and Outcomes

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What is PIAAC?

Program for the International Assessment of Adult Competencies

- The Program for the International Assessment of Adult Competencies (PIAAC) is a large-scale assessment that measures the basic cognitive and workplace skills—such as literacy, numeracy and digital problem solving-- needed for successful participation in an advanced economy.

- Administered in households to a nationally representative sample of 16- to 65-year-olds, residing in each country, irrespective of nationality, citizenship, or language status.

- Cycle 1 administered in 2011-2017 (39 countries or regions, including the U.S.)
  - U.S. administered 3 rounds of data collection (2012, 2014, 2017)
  - 66-to-74-year-olds in 2014 and 2017 in U.S. only
  - Prison sample in 2014 in U.S. only
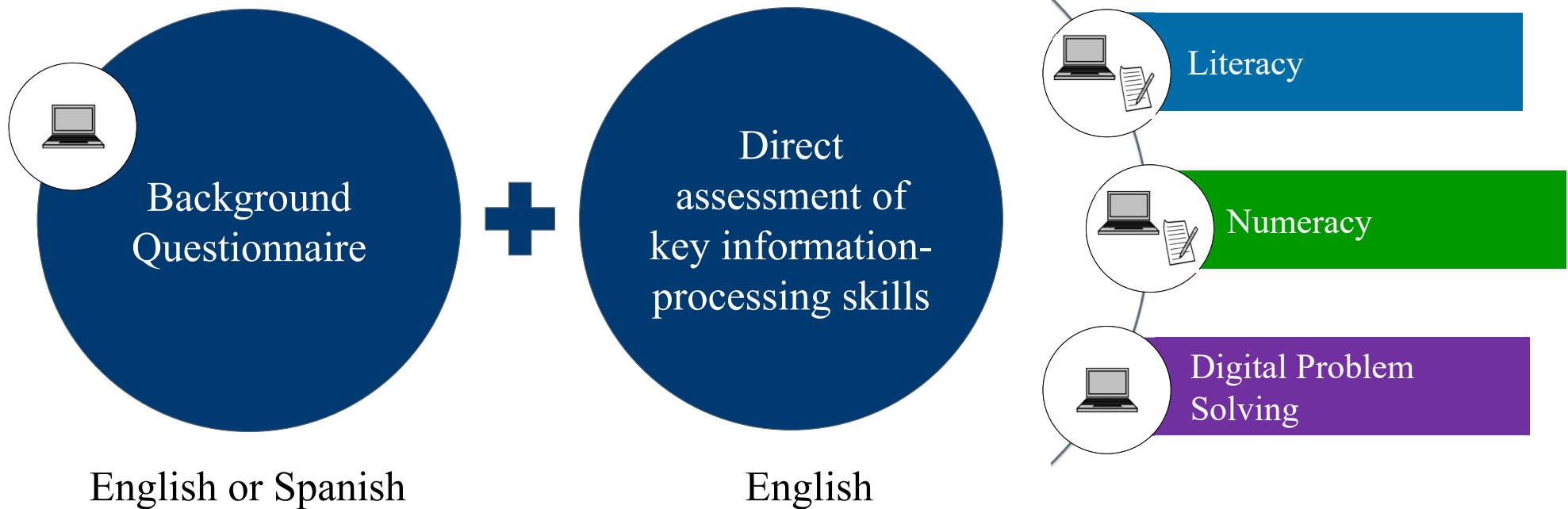 - 12,000+ U.S. sample across 3 rounds of household data collection

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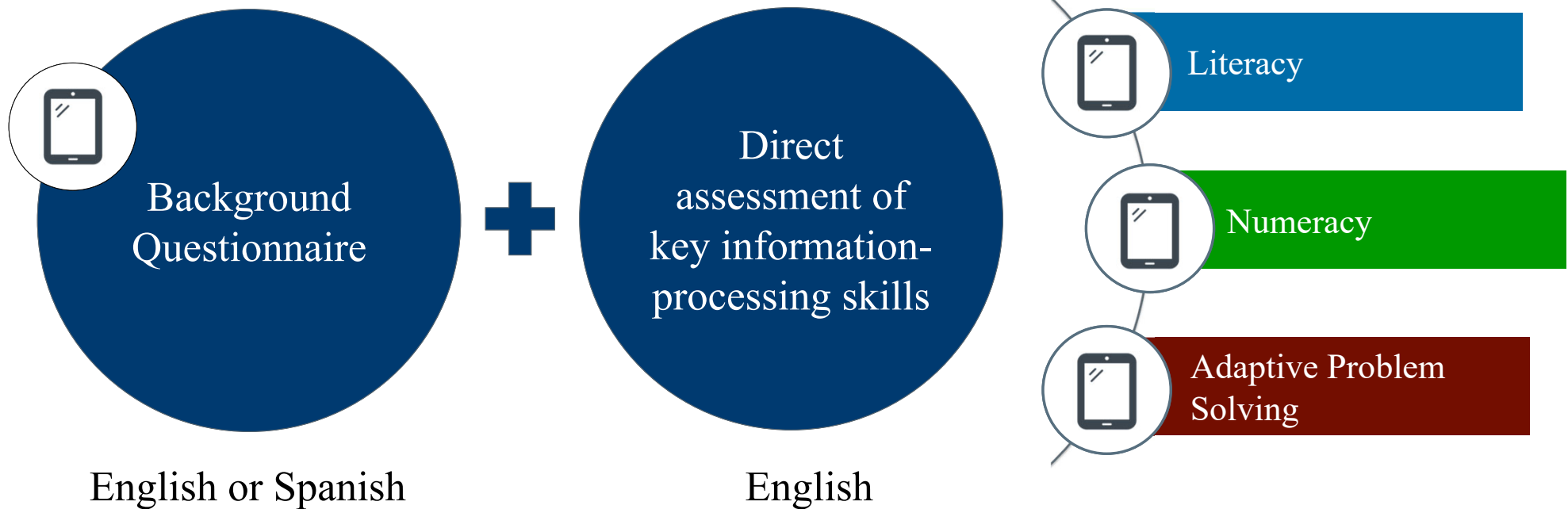Education Sciences

PIAAC Data Collections

	ROUND 1	ROUND 2	ROUND 3	ROUND 1
CYCLE 1				**CYCLE 2**
	2011–2012 Household	2014 Household Supplement Prison	2017 Household	*September 2022 –June 2023* Household

Cycle 2 PIAAC data and reports to be released in *December 2024*

PIAAC Cycle 2 was conducted in *31 countries*

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PIAAC Cycle 1 Main Components

Background Questionnaire

+

Direct assessment of key information-processing skills

English or Spanish

English

- Literacy
- Numeracy
- Digital Problem Solving

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PIAAC Cycle 2 Main Components

Background Questionnaire

+

Direct assessment of key information-processing skills

Literacy

Numeracy

Adaptive Problem Solving

English or Spanish

English

PIAAC Cycle 2 Background Questionnaire (BQ)

NEW ITEMS FOR CYCLE II

WORK
Changes in role with current employer, reasons for leaving job

SKILL USE
Type of digital devices outside work

EDUCATION AND TRAINING
Education pathways, training activities

INTERACTION AND SOCIAL SKILLS
Organization type, teamwork, social support and knowledge sharing, participation

U.S. ADDITIONS
Financial literacy, health maintenance, race, language, household income

PIAAC Cycle 2 BQ items on Digital Skills – In Everyday Life

- Ever used a smartphone, tablet, laptop or desktop computer
- How often different types of digital devices used in everyday life (smartphone, tablet, laptop or desktop computer)
- Frequency use of a computer or digital device outside work:
  - To communicate with others (e.g. via emails, social networking sites, or internet calls). Exclude normal phone calls using a mobile phone.
  - To access information (e.g. use a search engine, find information, or read documents).
  - For entertainment or leisure (e.g. play video games, listen to music, watch or edit videos or photos).
  - For online banking or e-commerce (e.g. buying or selling of goods or services).
  - To manage your personal life (e.g. track your health information, manage your household budget, or navigate via GPS).

PIAAC Cycle 2 BQ items on Digital Skills – At work

- Frequency of use of a computer or digital device such as a tablet or smartphone as part of job:
  - To communicate with others (e.g. via emails, social networking sites, or internet calls). Exclude normal phone calls using a mobile phone.
  - To access information (e.g. use a search engine, find information, or read documents).
  - To create or edit electronic documents, spreadsheets or presentations (using Microsoft Word, Excel, PowerPoint, or similar software).
  - To use specialized software (e.g. for computer-aided design, the processing or analysis of data, sound and images, or quality control).
  - To use a programming language to program software (e.g. applications) or websites.
- In last three years, has working environment significantly changed in the area of information and communication technologies
- The main focus of the training activity... Computer or software skills

- Many background variables throughout the BQ allow for comparison between the cycles of PIAAC

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PIAAC Cycle 1 Direct Assessment: Domains and Definitions

- **Literacy** is *understanding, evaluating, using* and *engaging* with written texts to participate in society, to achieve one's goals, and to develop one's knowledge and potential.

- **Numeracy** is the ability to *access, use, interpret, and communicate* mathematical information and ideas, in order to engage in and manage the mathematical demands of a range of situations in adult life.

- **Digital Problem Solving** involves using digital technology, communication tools and networks to *acquire* and *evaluate* information, *communicate* with others and *perform practical tasks*.

PIAAC Cycle 2 Direct Assessment: Domains and Definitions

- **Literacy** is *accessing*, *understanding*, *evaluating* and *reflecting* on written texts in order to achieve one's goals, to develop one's knowledge and potential and to participate in society.

- **Numeracy** is *accessing*, *using*, and *reasoning critically* with mathematical content, information and ideas represented in multiple ways in order to engage in and manage the mathematical demands of a range of situations in adult life.

  - **Numeracy Components**

- **Adaptive Problem Solving** involves the capacity to achieve one's goals in a dynamic situation, in which a method for solution is not immediately available. It requires engaging in cognitive and metacognitive processes to *define the problem, search for information*, and *apply a solution* in a variety of information environments and contexts.

Goals of PIAAC

- PIAAC aims to provide information on:
  - the level of skills in the adult population as a whole and for subgroups,
  - how adults develop and use their skills, and
  - what benefits these skills provide in the labor market and everyday life

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Overall Results from PIAAC Cycle 1

- In 2017, approximately 48 million U.S. adults had low English literacy skills and 69 million adults had low numeracy skills in English.

- U.S. adults scored higher in literacy than the PIAAC international average across participating countries; however, they scored lower in both numeracy and digital problem solving.

- In all three domains, U.S. adults with a high school diploma and those with less than a high school education scored lower than their peers internationally.

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Digital Literacy Rates from PIAAC Cycle 1

- The national estimate of 16 percent of adults who are not digitally literate translates into 31.8 million Americans who do not have sufficient comfort or competence with technology to use a computer.

DIGITAL LITERACY RATES
Percentage distribution of digital literacy status among U.S. adults ages 16–65: 2012

Not digitally literate, 16

5
7
4
84

- No computer experience
- Opted out of computer-based assessment
- Failed basic computer test
- Digitally literate
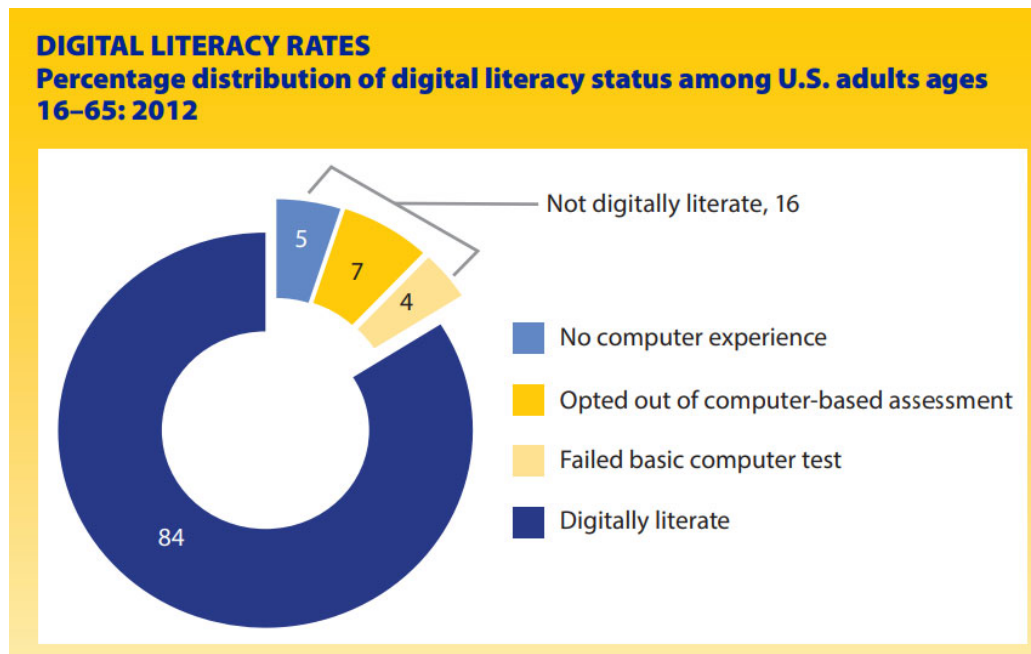
Source: *A Description of U.S. Adults Who Are Not Digitally Literate* (NCES 2018-161). U.S. Department of Education. Institute of Education Sciences, National Center for Education Statistics.

Digital Problem Solving Results from PIAAC Cycle 1

- 24 percent of U.S. adults taking the computer-based assessment performed at the lowest levels in digital problem solving in 2017.

Figure 1-B. Percentage distribution of U.S. adults age 16 to 65 at selected levels of proficiency on PIAAC digital problem solving: 2012/14 and 2017
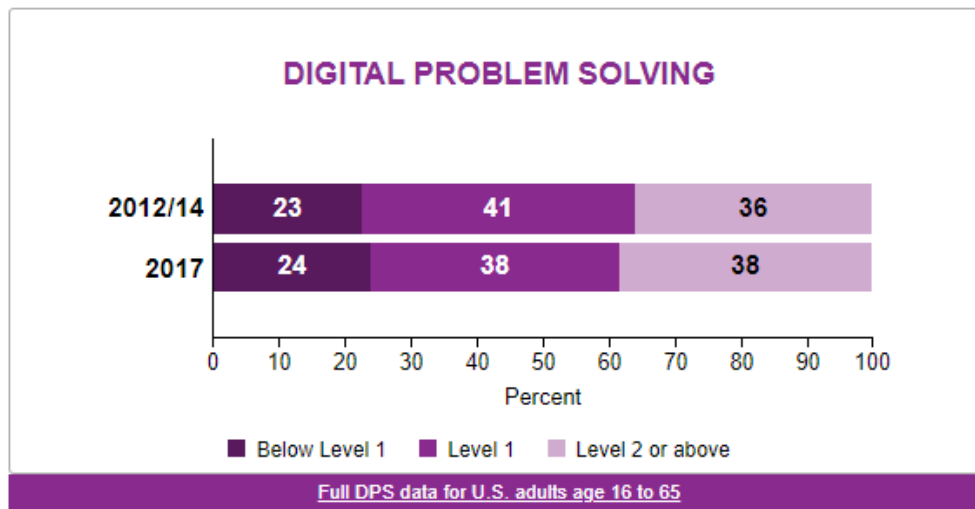
Source: *Highlights of the 2017 U.S. PIAAC Results Web Report* (NCES 2020-777). U.S. Department of Education. Institute of Education Sciences, National Center for Education Statistics.

Digital Problem Solving Results by Subgroups from PIAAC Cycle 1

- Adults in all demographic groups and across a variety of jobs performed at the lowest levels in digital problem solving

- For example,16-18% of the younger age groups performed at the lowest level.

Figure 3-B. Percentage distribution of U.S. adults age 16 to 65 at selected levels of proficiency on PIAAC digital problem solving, by age intervals: 2012/14 and 2017

Cycle 2 PIAAC Timeline and Products

- PIAAC Cycle 2 was conducted in *31 countries*

- Data collection in the U.S. was conducted between *September 2022 – June 2023*

- Initial Cycle II PIAAC reports to be released in *December 2024*

  - Highlights of U.S. National Results

  - U.S. Technical Notes

  - Updated PIAAC web site with 2022-23 information

  - Initial International Report from OECD

  - International Data Files from OECD

  - International Technical Report

- Releases following in *early- and mid-2025*

  - U.S. Results in International Context

  - U.S. National Data Files & Data Tools

  - U.S. Technical Report

  - U.S. Financial Literacy Report

PIAAC Products and Resources

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Adult Skills Tool: PIAAC Skills Map

State and County Indicators of Adult Literacy and Numeracy

State and County Workforce Skill Data

- PIAAC Skills Map provides
  - the most comprehensive picture on the literacy and numeracy skills of adults ages 16–74 in all 50 states, the District of Columbia, and for all 3,141 counties * for
    - overall population,
    - six age groups (16–24, 25–34, 35–44, 45–54, 55–64, and 65–74), and
    - four education groups (less than high school, high school diploma or GED, some college (no degree or attained associate's degree), and bachelor's degree or higher).
- The literacy and numeracy proficiency are reported as the percentage of adults with low, medium and high levels of proficiency and average score.

* Using the U.S. Census Bureau's definition of "county" for statistical purposes.

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Education and Skills Online (ESO)

- An assessment tool designed to provide individual level results linked to PIAAC
  - Shorter version of background questionnaire
    - Additional Career Interest and Intentionality module that uses the O*NET
  - full assessment of literacy, numeracy, digital problem solving
- Test codes are purchased by administering organization and provided to test-takers
- Used in the U.S. by 13 research and post-secondary institutions. Projects include:
  - digital literacy and readiness study on a state level (Hawaii),
  - workforce research,
  - accreditation reporting,
  - literacy interventions.
- Update including Cycle 2 features expected in 2025

PIAAC Resources

- **International — OECD Website**
  - Education and Skills Online (ESO)
  - PIAAC Release Webinar
- **National — NCES Website**
  - PIAAC Skills Map
  - International Data Explorer
  - PIAAC FAQ
  - 2017 and 2023(coming summer 2024) U.S. Background Questionnaire
- **Additional PIAAC Resource — PIAAC Gateway**
  - Sample PIAAC Tasks

Examples of Current PIAAC Products and Resources

Products

1. NCES-U.S. Publications, including:
   - Data Points
   - Info cards

2. Skills Map resources

3. Gateway resources, including:
   - tool kits
   - Infographics

4. Training and tutorials

5. Research conferences

6. Database of research papers

7. Webinars and presentations

   - Recording of RISE webinar on Skills Map

   - Recording of PIAAC research webinars

   - Other webinars and multi-media resources

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Research-to-Practice (Digital Problem Solving Guide)

Example activity

Table 6. Step 1

Step 1: Set a Goal	Activity Idea
This is "problem finding," or figuring out the end result, what you need to accomplish so that task completion is possible. You can set a goal after you recognize the difference between what is happening and what you want to be happening. Recognize that this might not be immediately clear. Decide how you will know when you have accomplished your goal.	Use the scenarios or problems that the learners identified in the previous exercise. Have them do "problem finding."

What is happening	What I want to happen
Need to contact teacher, but no phone number	Need to contact teacher some other way: possibly email or through online curriculum website
Need to pay a bill, but can't use a check	Need to find some way to pay electronically

U.S. PIAAC
Program for the International Assessment of Adult Competencies

Commissioned Paper
January 2017

Using the PIAAC Framework for Problem Solving in Technology-Rich Environments to Guide Instruction: An Introduction for Adult Educators

Author:

Jenifer B. Vanek

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Thank you!

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Digital Problem Solving (DPS) Sample Item

Adaptive Problem Solving (APS) Sample Item

SOURCE: *OECD (2021), The Assessment Frameworks for Cycle 2 of the Programme for the International Assessment of Adult Competencies, OECD Skills Studies, OECD Publishing, Paris.*

Adaptive Problem Solving Sample (APS) Item – continued

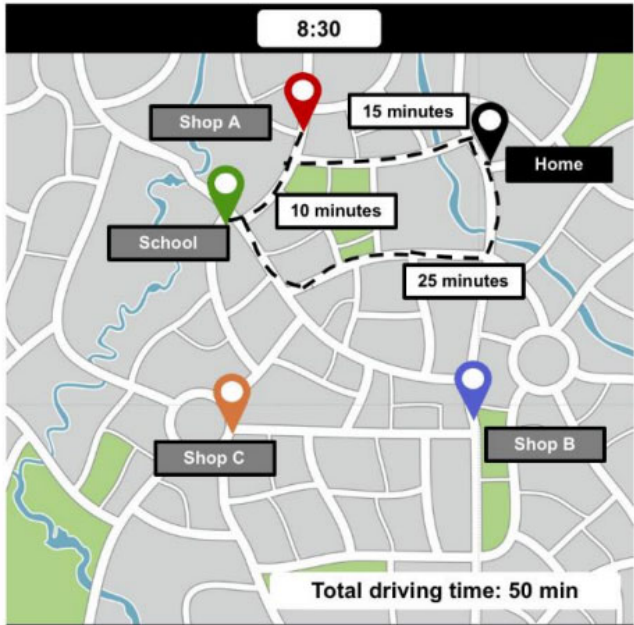SOURCE: *OECD (2021),* *The Assessment Frameworks for Cycle 2 of the Programme for the International Assessment of Adult Competencies*, *OECD Skills Studies, OECD Publishing, Paris.*