Believes

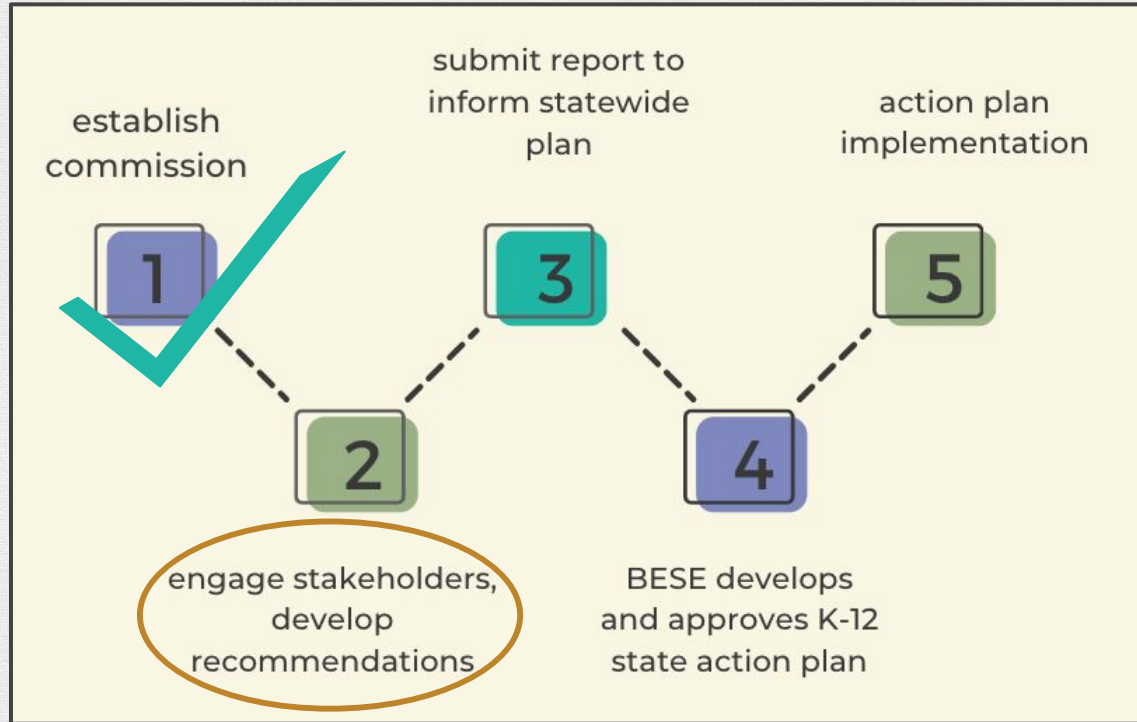# Computer Science Education Advisory Commission Meeting

October 27, 2022

Agenda

I. Call to order

II. Roll Call

III. Approval of Minutes from August 3, 2022

IV. Consideration of Status Report from Stakeholder Feedback on Current Computer Science Landscape

V. Consideration of K-12 Computer Science Framework

Approval of Minutes

from August 3, 2022

CS Education Advisory Commission Roadmap

- establish commission
- engage stakeholders, develop recommendations
- submit report to inform statewide plan
- BESE develops and approves K-12 state action plan
- action plan implementation

Consideration of Status Report from Stakeholder Feedback on Current Computer Science Landscape
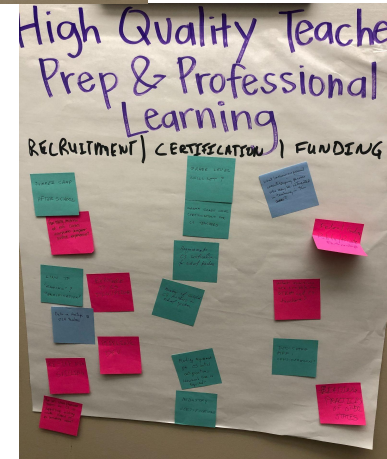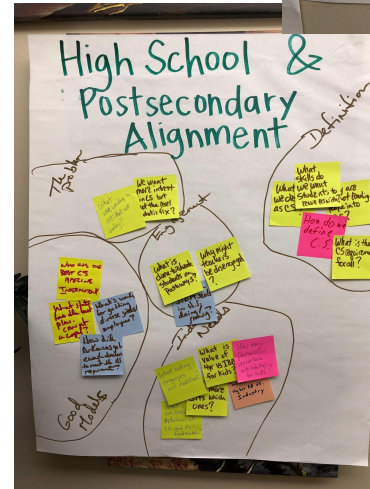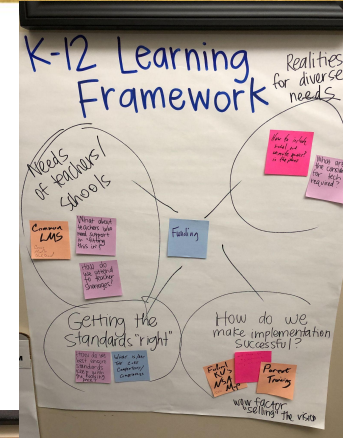
Commission Feedback August 3, 2022

The first meeting's data demonstrated a need to:

- examine ways to establish core CS competencies that align vertically K-12;
- grow and sustain CS teachers; and
- explore peer states' CS successes.

September CS Feedback Collection

Using the first Computer Science Education Advisory Commission meeting as guidance, the Department's staff began:

A. conducting four open-invitation statewide Zoom feedback sessions and a statewide K-12 teacher survey;

B. meeting with representatives and reviewing other states' CS education plans; and

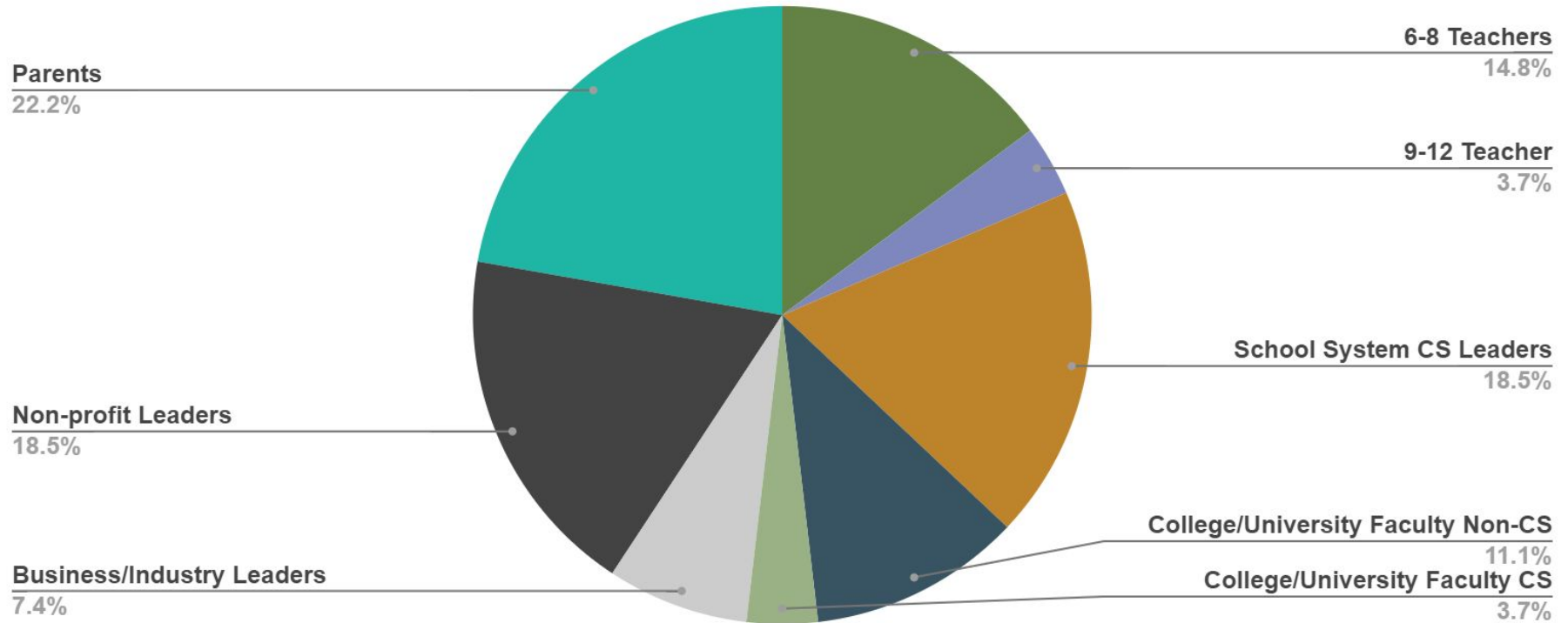C. analyzing commonalities in concepts and topics amongst state plans.

September Feedback Groups

The sessions collected responses to four question prompts:

1. What are the topics that you think students need to learn in Computer Science K-12?

2. What do you perceive as a barrier(s) or implementation issue to Computer Science Education?

3. When you think about Computer Science, what skills or techniques do employers and colleges currently look for in students post high school?

4. What questions on Computer Science do you have? Any thoughts you'd like to share that may not have been captured so far?

Feedback Group Participants

Parents
22.2%

6-8 Teachers
14.8%

9-12 Teacher
3.7%

School System CS Leaders
18.5%

Non-profit Leaders
18.5%

College/University Faculty Non-CS
11.1%

College/University Faculty CS
3.7%

Business/Industry Leaders
7.4%

September Feedback Group Key Takeaways

1. K-12 Computer Science Student Learning Needs

2. Post Graduation Computer Science Learning Needs of Students

3. Computer Science Implementation Barriers

4. K-12 Computer Science Educator Needs

Believes

K-12 CS Student Learning Needs

K-12 CS students need:

- **basic fundamental** CS skills;
- mathematics and algorithms **incorporated** into CS;
- **real world** CS tasks and challenges;
- increased **growth mindsets**;
- learning **anchored in data** and its analysis and/or manipulation;
- connection to all **careers** and **everyday life**; and
- **safe** and **ethical** computer hardware and software knowledge.

The Post Graduation CS Needs of Students

Post graduation CS students need:

- Industry Based Certifications (IBCs) **relevant** to **Louisiana**;
- **critical thinking** skills;
- technical **reading** and **writing skills**;
- **strong foundation** in mathematics;
- the ability to **communicate**, **collaborate**, and **problem solve** with a team;
- **creativity**, **curiosity**, and **problem identification** skills;
- **internships** and **real world** project **experiences**; and
- familiarity with **hardware**, **software**, **data analysis**, a coding **language**, and **networking**.

CS Education Implementation Barriers

The current barriers to CS education are:

- inadequate **time to teach** CS;
- lack of skills **vertical alignment** from K-College/Career;
- misunderstanding of **what CS is**;
- insufficient corequisite **math foundational skills**;
- limited or lacking teacher **training** and teacher **certification requirements**;
- CS **stereotypes**; and
- inadequate **equipment**.

K-12 CS Educator Needs

K-12 CS educators need:

- **professional learning** and support with **funding** to offer annual trainings in new technologies;
- funding for **equipment and resources** to update technology;
- **incentives** to help keep CS certified teachers in education;
- recognition of CS as a **cross curriculum discipline** that impacts many other disciplines;
- **professional support networks** to build and sustain best practices; and
- more options to **earn certification** and **build content knowledge**.

CS Education Continuous Feedback System

Commission Actions and Recommendations

Stakeholder Feedback Groups and Surveys

Commission Meeting Presentation and Public Comment

The Department's STEM Team Data Synthesis
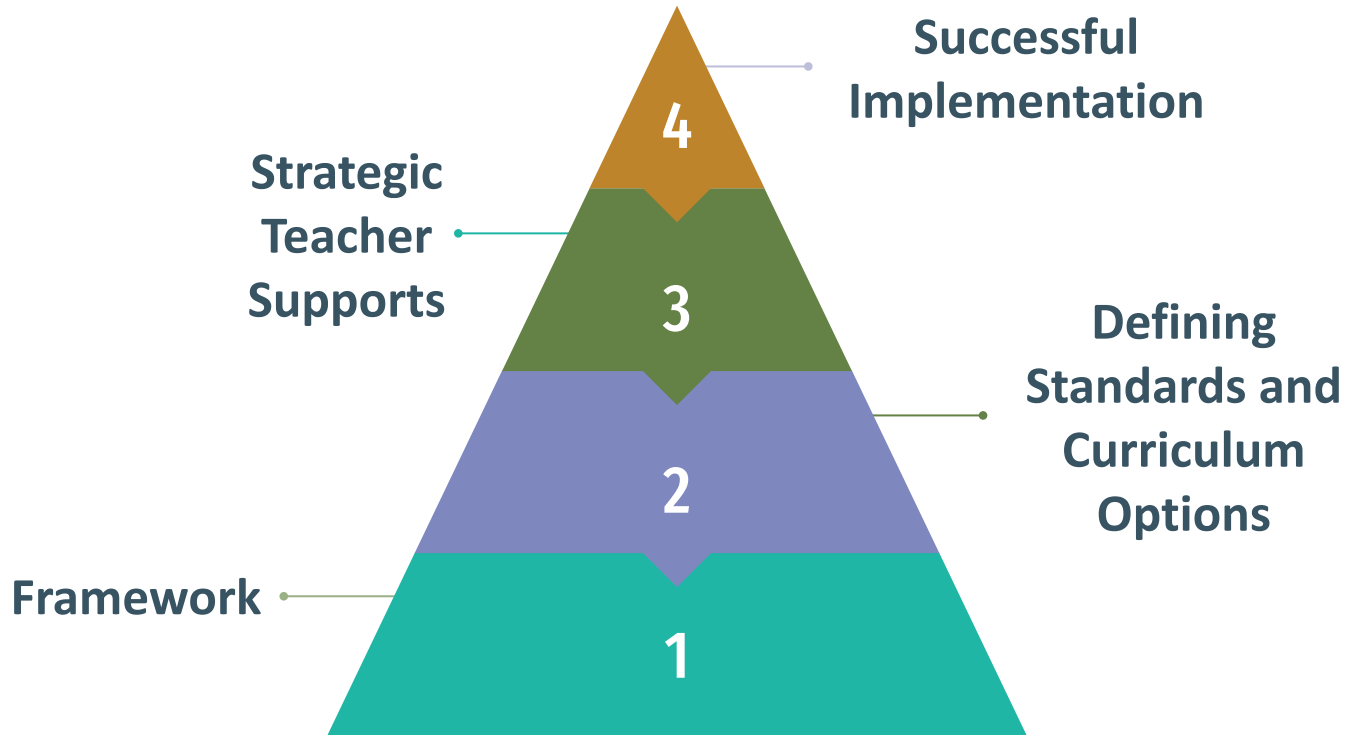
Peer State Computer Science Education Plan Review

CS State Plan Review Process

While analyzing each state's CS education plan, the following criteria were noted:

1) CS Framework Utilized

2) The CS Landscape

   a) Goals noted for stakeholders with timelines

   b) Strategies annotated with articulated timelines

3) CS Teacher Certification Processes

4) Funding Costs and Mechanisms

The Most Common CS Ed Plan Structure

Successful Implementation — 4

Strategic Teacher Supports — 3

Defining Standards and Curriculum Options — 2

Framework — 1

Believes

CS In-person Collaborations

The Commission Chair and members of the Department's Staff attended CSEdCon 2022. They collaborated with state, national, and international leaders in Computer Science Education and engaged in rich conversations on best practices, CS education plan creation tips, funding, and policy establishment.

- CSEdCon 2022: State of CS Report
- CSEdCon 2022: What students and parents think about CS
- CSEdCon 2022: State Education Chiefs Panel

CS In-person Collaborations Take-aways

1. Start with a framework to anchor your state vision and standards.
2. Examine the teacher needs, supports, and resources to expand the teacher workforce.
3. Leverage the intellectual capital of staff and professionals to build accessible ongoing professional learning.
4. Create a network of support that includes non-profits, industry, technical programs, colleges, universities, and families.
5. Make your state plan sustainable with purposeful planning on next steps and dedicated funding.

Consideration of K-12

Computer Science Framework

What is a Computer Science Framework?

The proposed Computer Science Framework will be our structure to provide cohesive guidance to the various components that will comprise Louisiana's Computer Science Education Plan. It is adaptable to work with varying teaching styles, specific content topics or areas, and to meet diverse student needs, while maintaining the core framework structures.

Believes

CS Education Plan Comparisons

In the examination of the top 40% of U.S. States, as ranked by the 2021 State of CS Report, three peer states' plans were examined in detail. These states were selected based upon their progress, performance ratings, and similarity of student populations.

#1 Arkansas
#2 South Carolina
#21 Georgia

Examining 3 States' Framework Landscape Selection

All three of the selected states utilized the National K-12 Computer Science Framework. This framework was selected because of the time and expertise that was put into its creation.

Framework Writers:

- 14 of the top ranked states for CS Education Implementation
- Members of Association for Computing Machinery (ACM)
- Computer Science Teachers of America (CSTA)
- Code.org
- Cyber Innovation Center now Cyber.org
- National Math + Science Initiative (NMSI)

Framework Commonality

"The K–12 Computer Science Framework illuminates the big ideas of computer science through a lens of concepts (i.e., what students should know) and practices (i.e., what students should do). The core concepts of the framework represent major content areas in the field of computer science. The core practices represent the behaviors that computationally literate students use to fully engage with the core concepts of computer science. The framework's learning progressions describe how students' conceptual understanding and practice of computer science grow more sophisticated over time. The concepts and practices are designed to be integrated to provide authentic, meaningful experiences for students engaging in computer science" (National K-12 Computer Science Framework, 2016, p. 3).

Believes

National K-12 Computer Science Framework

The Concepts and Practices of the K–12 Computer Science Framework
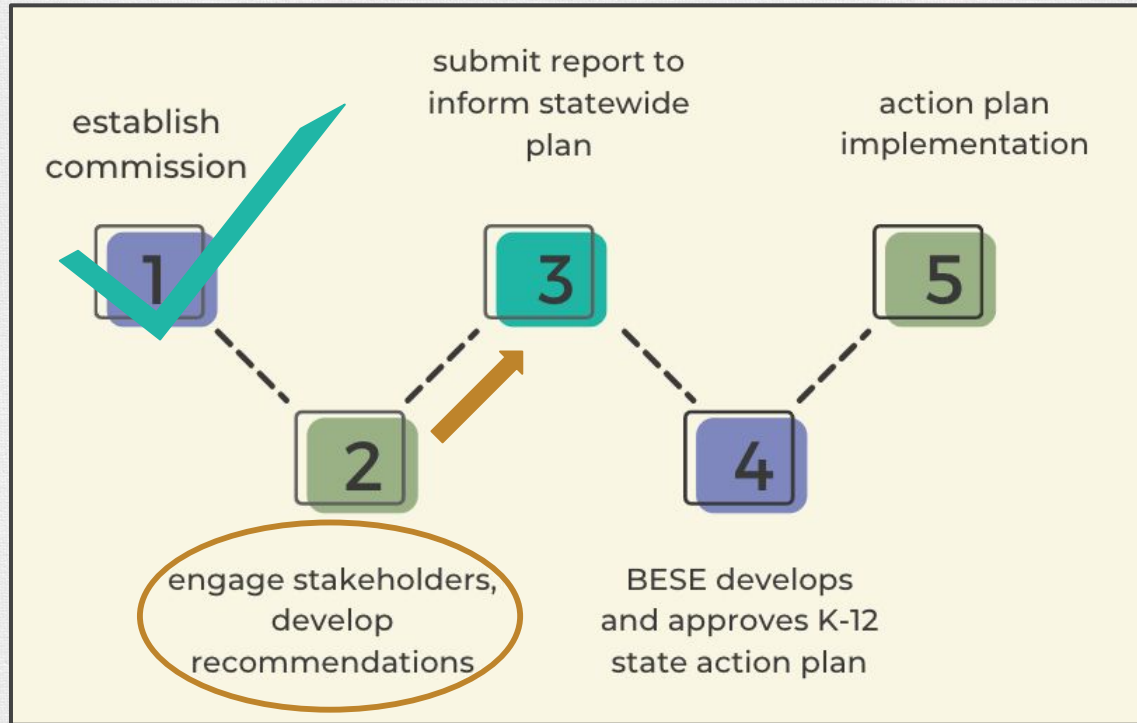
Core Concepts

1. Computing Systems
2. Networks and the Internet
3. Data and Analysis
4. Algorithms and Programming
5. Impacts of Computing

Core Practices

1. Fostering an Inclusive Computing Culture
2. Collaborating Around Computing
3. Recognizing and Defining Computational Problems
4. Developing and Using Abstractions
5. Creating Computational Artifacts
6. Testing and Refining Computational Artifacts
7. Communicating About Computing

Importance of CS Framework

establish commission

1

submit report to inform statewide plan

3

action plan implementation

5

engage stakeholders, develop recommendations

2

BESE develops and approves K-12 state action plan

4

Work Group Activity

1. Individually, use your CS Framework thought catcher to make any suggestions, clarifications, and/or substitutions to the core concepts and practices. (10 minutes)
2. Once in your group, designate a spokesperson/recorder for the group who will capture the feedback your group agrees upon.
3. As the group discuss their thoughts have your recorder capture them on one thought catcher to share with the commission. (20 minutes)

The Concepts and Practices of the K–12 Computer Science Framework

Core Concepts

1. Computing Systems
2. Networks and the Internet
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4. Algorithms and Programming
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Core Practices

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6. Testing and Refining Computational Artifacts
7. Communicating About Computing

Believes

30 Minutes of Group Work Time
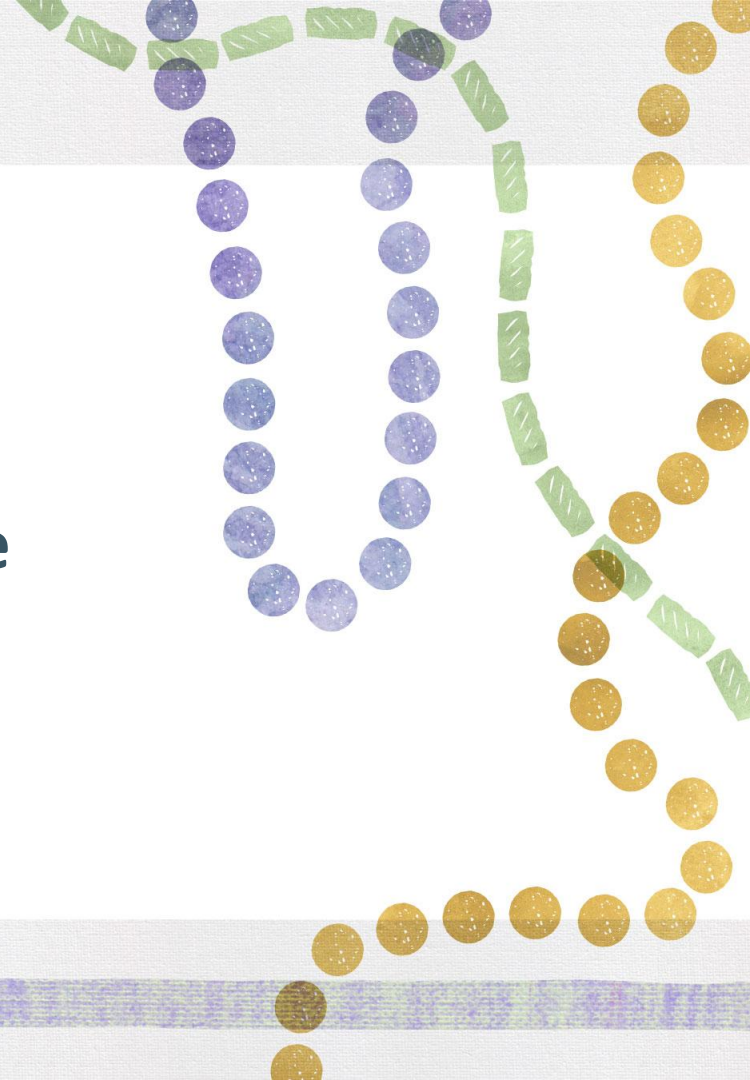
Commission Breakout Workgroups Share-outs

Revisiting Our Meeting Timeline

August 3, 2022	October 27, 2022	February 8, 2023	May 3, 2023	August 2, 2023	October 4, 2023
Alignment	**Framework**	**Teacher PD**	**Post 12 & Funding**	**Report Draft**	**Finalize Report**
research	analyze findings			finalize report	BESE receives December 13, 2023
	draft recommendations				
ongoing stakeholder engagement					

Believes

Meeting Schedule

Date and Time	Meeting and Location
August 3 1:30 p.m.	Meeting 1 Claiborne Building, Baton Rouge
October 27 1:30 p.m.	Meeting 2 Claiborne Building, Baton Rouge
February 8, 2023 1:30 p.m.	Meeting 3 Claiborne Building, Baton Rouge
May 3, 2023 1:30 p.m.	Meeting 4 Claiborne Building, Baton Rouge
August 2, 2023 1:30 p.m.	Meeting 5 Claiborne Building, Baton Rouge
October 4, 2023 1:30 p.m.	Meeting 6 (Finalize report draft for BESE) Claiborne Building, Baton Rouge
December 13, 2023 TBD	December BESE Meeting Claiborne Building, Baton Rouge

Believes

Adjournment

Email ashley.townsend@la.gov with questions.