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The Progress of the Five Term Co-op Program at Grain Processing Corporation and Michigan Tech University

Agenda

- Who is GPC
- Evolution to Multiple Term Co-ops
  - Partnership with MTU
  - Work Sessions
  - Structure
- Five Term Co-op
  - Advantages and Disadvantages
- Testimonial

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KENT
NUTRITION
GROUP

PF®
PRECISION
FOODS INC

GPC™

BLUE
SEAL®

KENT®

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Plant originally produced industrial alcohol for manufacturing of synthetic rubber for WWII

GPC Plant purchased in 1953 from the Gov't.

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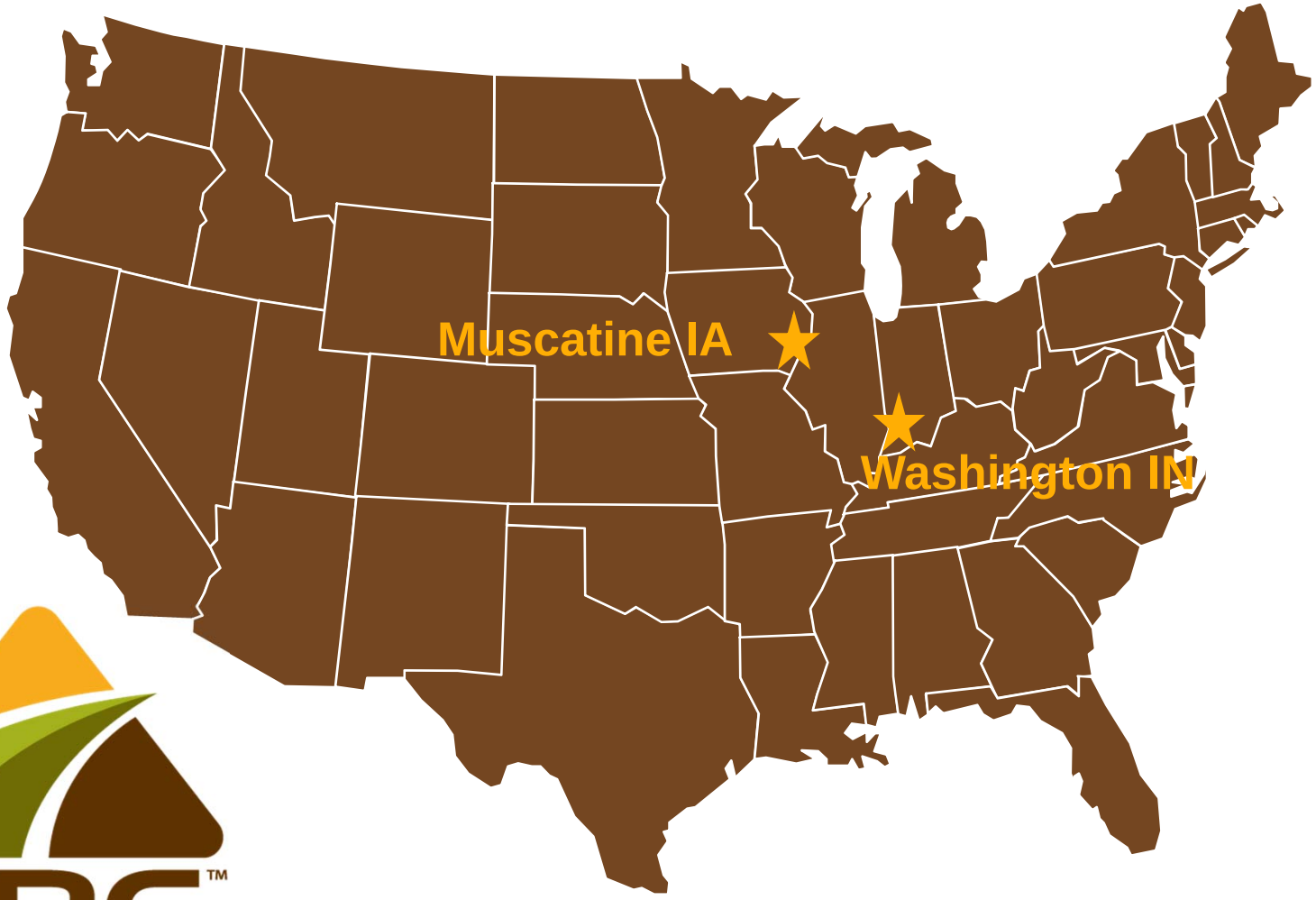
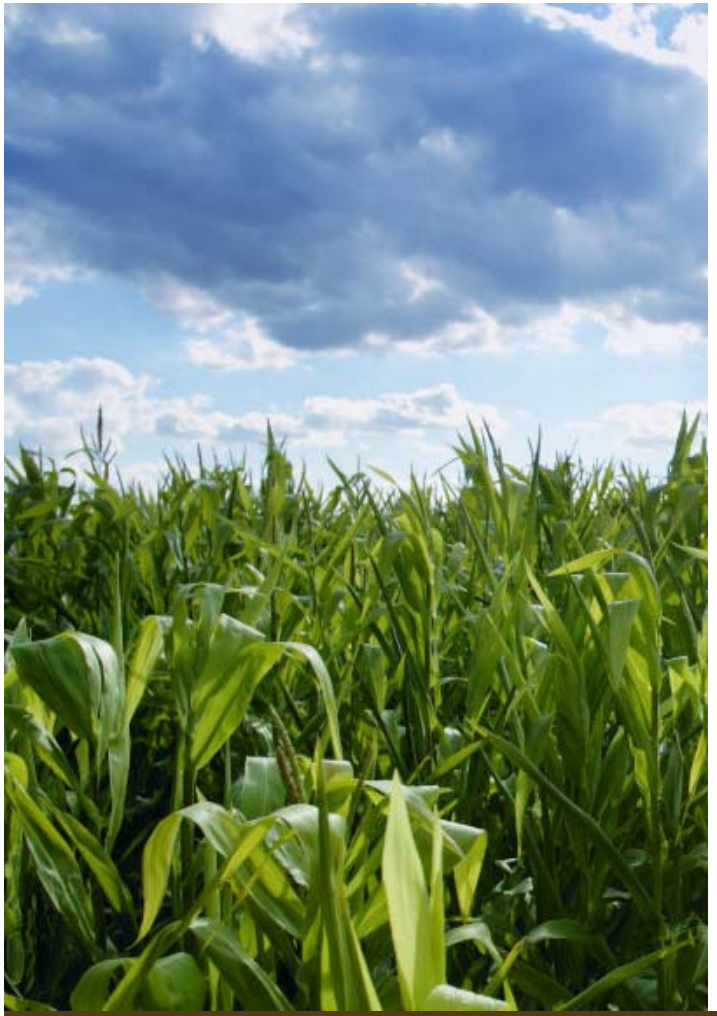
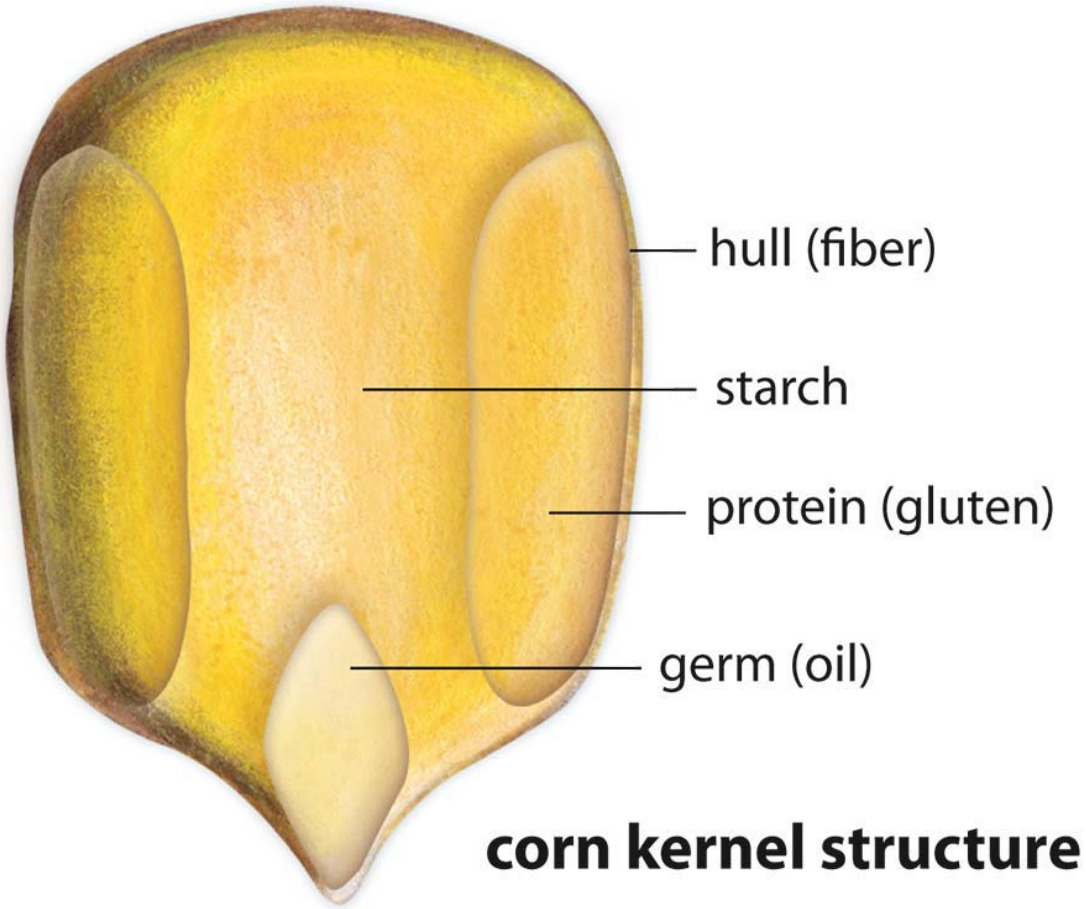


GPC™

Headquarters, R&D, & Production Facilities
Muscatine, Iowa

Production Facility
Washington, Indiana




hull (fiber)
starch
protein (gluten)
germ (oil)
corn kernel structure

Corn Kernel

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Alcohol Products

- Industrial
  - 190 Proof
  - 200 Proof
- Beverage
- Fuel

Industrial Starch Products

- Industrial Starches
  - Modified
  - Unmodified
- Adhesives & Resins

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Food, Pharmaceutical, Personal Care

- MALTRIN® Maltodextrins and Corn Syrup Solids
- TruBran® Corn Bran
- Modified and Unmodified Food Starches
- Food/Pharmaceutical/Personal Care Starches

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Animal Feed Ingredients and Co-Products

- Distillers Dried Grains With Solubles
- Corn Gluten Meal
- Corn Gluten Feed
- Liquid Feed Syrup
- Crude Corn Oil
- Whole Kernel Germ

Division Engineer 5 Term Co-op

- Timeline
  - Decision was made to evolve away from Interns at Muscatine
  - Decision was made to expand to additional Universities
  - Approached Jeff Kangus June, 2010
  - Departments approved new 5 year course schedules
  - Info session at Fall Career Fair
  - Recruited at Spring Career Fair
  - New Co-ops began Summer 2011

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Mechanical Engineering Co-op Curriculum

Michigan Tech – BSME (Co-op/internships) - Cycle 1 9.24.2010

Fall - Year 1		Spring - Year 1		Summer - Year 1	
Course	Credits	Course	Credits	Course	Credits
UN 1001	3	UN 1002	4	Internship	0
CH 1150/1	4	PH 2100	3		
PH 1100	1	MY 2100	3		
MA 1160	4	MA 2160	4		
ENG 1101	3	ENG 1102	3		
Co-curricular	1 unit*	Co-curricular	1 unit*		
Total Credits	15	Total Credits	17	Total Credits	0
Fall - Year 2		**Spring - Year 2**		**Summer - Year 2**	
Course	Credits	Course	Credits	Course	Credits
UN 2001	3	UN 3002	2	MEEM 2150	3
MA 3160	4	(free elective)		MEEM 2200	3
MEEM 2110	3			MEEM 2700	3
MEEM 2500	4			MA 2320	2
PH 1200	1			MA 3520	2
PH 2200	3			Co-curricular	1 unit*
Total Credits	18	Total Credits	2	Total Credits	13
Fall - Year 3		**Spring - Year 3**		**Summer - Year 3**	
Course	Credits	Course	Credits	Course	Credits
UN 3002	2	MEEM 3210	3	Internship	0
(free elective)		MEEM 3220	1		
		MEEM 3501	3		
		EE 3010	3		
		MA 3710	3		
		UN 2002	3		
Total Credits	2	Total Credits	16	Total Credits	0
Fall - Year 4		**Spring – Year 4**		**Summer – Year 4**	
Course	Credits	Course	Credits	Course	Credits
EC 3400	3	UN 3002	2	Off	
MEEM 3900	3				
MEEM 3700	3				
MEEM 3000	2				
MEEM 3230	3				
MEEM 3502	3				
Total Credits	17	Total Credits	2	Total Credits	0
Fall - Year 5		**Spring - Year 5**			
Course	Credits	Course	Credits		
Gen'l Education	3	Gen'l Education	3		
Gen'l Education	3	Gen'l Education	3		
MEEM 4700	4	Technical elective	3		
Technical elective	3	Technical elective	3		
MEEM 4901	2	MEEM 4911	2		
Total Credits	15	Total Credits	14		

* Co-curricular units are not in credit totals

Michigan Tech – BSME (Co-op/internships) - Cycle 2 9.24.2010

Fall - Year 1		Spring - Year 1		Summer - Year 1	
Course	Credits	Course	Credits	Course	Credits
UN 1001	3	UN 1002	4	Off	0
CH 1150/1	4	PH 2100	3		
PH 1100	1	MY 2100	3		
MA 1160	4	MA 2160	4		
ENG 1101	3	ENG 1102	3		
Co-curricular	1 unit*	Co-curricular	1 unit*		
Total Credits	15	Total Credits	17	Total Credits	0
Fall - Year 2		**Spring - Year 2**		**Summer - Year 2**	
Course	Credits	Course	Credits	Course	Credits
UN 3002	2	UN 2001	3	Internship	0
(free elective)		MA 3160	4		
		MEEM 2110	3		
		MEEM 2500	4		
		PH 1200	1		
		PH 2200	3		
Total Credits	2	Total Credits	18	Total Credits	0
Fall - Year 3		**Spring - Year 3**		**Summer - Year 3**	
Course	Credits	Course	Credits	Course	Credits
MEEM 2150	3	UN 3002	2	MEEM 3210	3
MEEM 2200	3	(free elective)		MEEM 3220	1
MEEM 2700	3			MEEM 3501	3
MA 2321/3521	4			UN 2002	3
EE 3010	3			MA 3710	3
Co-curricular	1 unit*				
Total Credits	16	Total Credits	2	Total Credits	13
Fall - Year 4		**Spring – Year 4**		**Summer – Year 4**	
Course	Credits	Course	Credits	Course	Credits
UN 3002	2	EC 3400	3	Internship	0
		MEEM 3900	3		
		MEEM 3700	3		
		MEEM 3000	2		
		MEEM 3230	3		
		MEEM 3502	3		
Total Credits	2	Total Credits	17	Total Credits	0
Fall - Year 5		**Spring - Year 5**			
Course	Credits	Course	Credits		
Gen'l Education	3	Gen'l Education	3		
Gen'l Education	3	Gen'l Education	3		
MEEM 4700	4	Technical elective	3		
Technical elective	3	Technical elective	3		
MEEM 4901	2	MEEM 4911	2		
Total Credits	15	Total Credits	14		

* Co-curricular units are not in credit totals

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Chemical Engineering Co-op Curriculum

B.S. in Chemical Engineering

Grain Processing Corporation Co-op Program

Michigan Tech
Michigan Technological University
Department of Chemical Engineering

Students in the Grain Processing Corporation co-op program participate in a five-semester co-op rotation.

Freshman Year

Fall Semester

Course	Title	Cr
CH 1150	U Chem I	3
CH 1151	U Chem I Lab	1
CH 1153	U Chem I Rec	1
ENG 1101	Eng Anal & Prob	3
MA 1160	Calc w/Tech I	4
PH 1100	Phys by Inq I	1
UN 1001	Perspectives	3
Co-Curr (1 unit)*	**Total**	**16**

Spring Semester

Course	Title	Cr
CH 1160	U Chem II	3
CH 1161	U Chem II Lab	1
ENG 1102	Eng Mod & Desi	3
MA 2160	Calc w/Tech II	4
PH 2100	U Physics I	3
UN 1002	World Cultures**	4
	Total	**18**

Summer Semester

Course	Title	Cr
CH 2410	Org Chem I (A)	3
CH 2411	Org Ch Lab I (A)	1
CM 2110	Fund ChE I (A)	3
MA 3160	Multiva Calc (B)	4
UN 2001	Composition (B)	3
	Total	**14**

Sophomore Year

Fall Semester

Course	Title	Cr
UN 3002	Co-op Ed Lab	2
	Total	**2**

On co-op with GPC

Spring Semester

Course	Title	Cr
CH 2420	Org Chem II	3
CM 2120	Fund of ChE II	3
MA 2321	El Linear Algebra	2
MA 3521	El Diff Equations	2
PH 1200	Phys by Inq II	1
PH 2200	U Physics II	3
UN 2002	Institutions	3
Co-Curr (1 unit)*	**Total**	**17**

Summer Semester

On co-op with GPC

Junior Year

Fall Semester

Course	Title	Cr
CH 3510	P Chem I	3
CH 3511	P Chem Lab I	2
CM 3110	Trans/Unit Op I	3
CM 3215	Fund of ChE Lab	2
CM 3410	Tech Comm	3
	HASS Dist*	3
Co-Curr (1 unit)*	**Total**	**16**

Spring Semester

Course	Title	Cr
UN 3002	Co-op Ed Lab	2
	Total	**2**

On co-op with GPC

Summer Semester

Relax!!

Senior Year 1

Fall Semester

Course	Title	Cr
UN 3002	Co-op Ed Lab	2
	Total	**2**

On co-op with GPC

Spring Semester

Course	Title	Cr
CM 3120	Trans/Unit Op II	3
CM 3230	Thermo for ChE	4
CM 3310	Process Control	3
CM 3510	Chem Rx Eng	3
	HASS Dist*	3
	Total	**16**

Summer Semester

On co-op with GPC

Senior Year 2

Fall Semester

Course	Title	Cr
CM 4110	UO Lab	3
CM 4310	Safety/Environ	3
CM 4855	ChE Design I	3
	Tech Elective*	3
	HASS Dist*	3
	Total	**15**

Spring Semester

Course	Title	Cr
CM 4120	Chem Plant Lab	3
CM 4860	ChE Design II	2
CM 4861	ChE Design Lab II	1
	Tech Elective*	3
	HASS Dist*	3
	Free Elective*	1
	Total	**13**

*See back for description.

**Two semesters of a single modern language (6 cr) in addition to UN1003 (1cr) can substitute for UN1002 and 3 credits of HASS distribution course requirements.

Updated 9/21/2010

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Attention FRESHMAN Mechanical, Electrical, and Chemical Engineering Students

Grain Processing Corporation is hosting an informational session on a five term co-op program

When: February 20, 2012; 6 • 7:30 p.m.
Where: Memorial Union, Ballroom B-2

Food and drinks will be provided!

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WORK SESSION 1

- Two months learning process by training with operators from the three operational areas of the plant
- Trace and correct piping and instrument diagrams
- Perform data analysis on process parameters
- Train on company computer systems

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WORK SESSION 2

- Assist division engineer with process and project related activities
- Continue to perform data analysis on process parameters, including plant material balances
- Continue tracing and correcting piping and instrument diagrams

WORK SESSION 3

- Continue assisting division engineers in process and project related activities
- Continue performing data analysis on process parameters including plant material balances
- Update standard operating procedures

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WORK SESSION 4

- Assist division and department Superintendants in troubleshooting process problems
- Assist management in construction of smaller capital projects
- Assist in operator training on standard operating procedures and/or other new procedures
- In-depth analysis and development of plant operating parameters

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WORK SESSION 5

- Design, bid, and manage construction of capital projects
- Lead in-depth analysis and development of plant operating parameters, material balances, and operating models
- Recommend changes as needed
- Recommend changes and improvements after analyzing process problems

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Division Engineer 5 Term Co-op

- Considerations
  - Housing
  - Time off
  - Fundamental Fridays
  - Compensation

Work Period	Recommended percent of graduate offers
1	58-62%
2	62-70%
3	70-75%
4	75-80%
5	80-85%

Division Engineer 5 Term Co-op

- Advantages
  - Reduces recruiting costs
  - Much greater evaluation period
  - Greater productivity during work sessions
  - Prepared for full job responsibilities upon employment
  - Takes students off the job market

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Division Engineer 5 Term Co-op

- Disadvantages
  - Evaluate and hire Freshman
    - Immaturity
    - Difficult to project potential
  - Exposure to smaller number of candidates
  - Higher consequences for low performance

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Presented by:

Perry Helmer

About Me

- Chemical Engineering Student at Purdue University
- 5 Term Co-Op With GPC (Plus Bonus 6th)
- From Austin, TX
- Chose Purdue for Professional Practice
- 1 in 5 Purdue Chemical Engineering students currently in a co-op program

Grain Processing Co-Op

- 1st Term: 3 Months Operations Training
- 2nd & 3rd Terms (~9 Months): General Project Work
  - Maintained over a $400,000 budget on 10-20 projects in all departments
- 4th - 6th Terms (~1 Year): Central Engineering
  - Developed Process Models to Identify Cost Centers and Identify Operational Issues
  - Worked with Research to Find Alternative Technologies to Minimize Cost
  - Major Unit Operation Startup

GPC Co-Op
Advantages / Disadvantages

Advantages

- Experience: 1.5 – 2 Years
- Meaningful Work
- Substantial Responsibility
- Mentoring / Leadership
- Location (4^{th} – 6^{th} Terms)
- Pay / College Expenses
- Housing

Disadvantages

- Moving Frequency
- Location (1^{st} – 3^{rd} Terms)

GPC Co-Op
Advantages / Disadvantages

Advantages

- Off – Semester Classes
- Co – Op “Class”
- Job Security
- Exposure to Real Applications
- Demand for Skills Prior to Instruction
- Immediate Applicability

Disadvantages

- Off – Semester Classes
- Co – Op “Class”
- Curriculum Continuity/Organization
- 5 Years
- Commitment

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Questions?