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## Think Aloud in Pairs for Problem Solving (TAPPS) • Role Cards (front side)

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### The Problem Solver

#### Think Aloud Pairs Problem Solving Protocol

- Read and solve the problem as much as you can on your own.
- Whenever you read or write say aloud the thoughts you are thinking to understand and solve the problem.
- Afterwards listen to your partner's report. Then discuss your processes and solution approaches with your partner.
- Finally, discuss the problem and finish the solution.

#### Metacognitive Starters

- I am looking for ...
- I notice ...
- What's important is ...
- This reminds me of ...
- I am thinking about ...
- What I know is ...
- A picture/graph I can draw is ...
- I wonder ...
- A question I have is ...
- I am confused by ...
- What might be true is ...
- I predict ...
- I could try ...
- An equation I could write is ...
- The big idea is ...
- What I now know is ...
- What is interesting is ...

### The Listener

#### Think Aloud Pairs Problem Solving Protocol

- Listen to your partner's Think Aloud comments and watch your partner's solution work.
- Make notes about your partner's reading and problem solving processes.
- Prompt your partner to say aloud his/her thoughts whenever they stop thinking aloud.
- Afterwards tell your partner what you noticed about their reading and problems solving processes.
- Finally, discuss the problem and help finish the solution.

#### Metacognitive Coaching Prompts

- What are you focusing on?
- What are you thinking now?
- Could you tell me more?
- What are you doing (or writing) now?
- Please elaborate.
- I can't follow that.
- Run that by me again.

A great discovery solves a great problem but there is a grain of discovery in the solution of any problem. Your problem may be modest; but if it challenges your curiosity and brings into play your inventive facilities, and if you solve it by your own means, you may experience the tension and enjoy the triumph of discovery  
George Polya (How to Solve It)

Solving problems is a practical art, like swimming, or skiing, or playing the piano: you can learn it only by imitation and practice. . . . If you wish to learn swimming you have to go in the water, and if you wish to become a problem solver you have to solve problems  
George Polya (Mathematical Discovery)