This presentation is a collaborative effort between the following:

Tri-State Autism Spectrum Disorder Webinar Series

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The contents of this power point presentation were developed under a grant from the Nebraska Department of Education, IDEA parts B and C from the U.S. Department of Education. However, this content does not necessarily represent the policy of the U.S. Department of Education and you should not assume endorsement by the Federal Government.

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Supporting Literacy in Individuals with Autism through the use of Assistive Technologies

Objectives

✓ Gain understanding of common reading barriers for students with ASD
✓ Gain understanding of features of technology that address reading barriers
✓ Gain understanding of the need and process to feature matching student needs and technology features
✓ Become informed of AT tools for reading

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The reading problems of those with autism may not be obvious initially and may worsen over time.
### Autism Characteristics

<table>
<thead>
<tr>
<th>DSM-5</th>
<th>Federal Definition of Autism</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Fixated Interests and Repetitive Behaviors</strong></td>
<td></td>
</tr>
</tbody>
</table>
| a) Stereotyped or repetitive speech, motor movements, or use of objects | • Engagement in repetitive activities and stereotyped movements  
• Disability affecting verbal communication  
• Disability affecting nonverbal communication  
• Disability affecting social interactions |
| b) Excessive adherence to routines, ritualized patterns of verbal or nonverbal behavior, or excessive resistance to change | • Resistance to environmental change or change in daily routine |
| c) Highly restricted, fixated interests that are abnormal in intensity or focus | • Engagement in repetitive activities |
| d) Hyper-or hypo-reactivity to sensory input or unusual interest in sensory aspects of environment | • Unusual responses to sensory experiences |

### Autism Characteristics

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<thead>
<tr>
<th>DSM-5</th>
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<tr>
<td><strong>Qualitative Impairments in social communication</strong></td>
<td></td>
</tr>
</tbody>
</table>
| a) Deficits in social-emotional reciprocity                          | • Disability affecting social interactions  
• Disability affecting verbal communication  
• Disability affecting nonverbal communication |
| b) Deficits in nonverbal communicative behaviors used for social interaction | • Disability affecting social interactions  
• Disability affecting verbal communication |
| c) Deficits in developing and maintaining relationships, appropriate to developmental level | • Disability affecting social interactions |
### Socialization and Literacy Impact

<table>
<thead>
<tr>
<th>Area of Developmental Concern</th>
<th>Possible effect on Literacy and Comprehension</th>
</tr>
</thead>
<tbody>
<tr>
<td>Play Skills</td>
<td>Cognitive development, learning and literacy</td>
</tr>
<tr>
<td>Shared Enjoyment</td>
<td>Decreased time in shared activities including reading</td>
</tr>
<tr>
<td>Joint Attention</td>
<td>Limited attending to reading activities with others</td>
</tr>
<tr>
<td>Imitative Play</td>
<td>Practice of roles and actions in real like may impact understanding of those roles and actions in storybooks</td>
</tr>
<tr>
<td>Imaginary Play</td>
<td>Understanding of imaginary content in books</td>
</tr>
<tr>
<td>Conversations with Adults</td>
<td>Decreased language development</td>
</tr>
<tr>
<td>Social Experiences</td>
<td>Limited SE yields limited understanding of vocab and storyline (plot, characters etc.)</td>
</tr>
<tr>
<td>Social Understanding</td>
<td>Difficulty relating to story lines and characters</td>
</tr>
<tr>
<td>Perspective Taking</td>
<td>Understanding of characters and interactions</td>
</tr>
</tbody>
</table>

### Communication and Literacy Impact

<table>
<thead>
<tr>
<th>Area of Developmental Concern</th>
<th>Possible effect on Literacy and Comprehension</th>
</tr>
</thead>
<tbody>
<tr>
<td>Language development</td>
<td>Comprehension of word, sentence and text</td>
</tr>
<tr>
<td>Oral language</td>
<td>Spoken language relates to written language</td>
</tr>
<tr>
<td>Recognizing and responding to non-verbal language</td>
<td>Misses context cues and foreshadowing</td>
</tr>
<tr>
<td>Literal interpretation of language</td>
<td>Difficulty with idioms, connotation, multiple meaning words, metaphors, figurative language, hyperbole and personification</td>
</tr>
<tr>
<td>Understanding relationships between words and meaning</td>
<td>Difficulty organizing and categorizing words impacting recall of information</td>
</tr>
<tr>
<td>Interpretative language abilities</td>
<td>Generating inferences, resolving ambiguity, cause and effect, monitoring comprehension</td>
</tr>
<tr>
<td>Difficulties with pronouns</td>
<td>Loss of meaning and confusion of characters</td>
</tr>
<tr>
<td>Difficulty generating questions while reading</td>
<td>Difficulty establishing meaning and relevance</td>
</tr>
<tr>
<td>Listening and understanding oral language</td>
<td>Misses out on content of oral literacy activities</td>
</tr>
</tbody>
</table>
### Restrictive and Repetitive Behavior and Literacy Impact

<table>
<thead>
<tr>
<th>Area of Developmental Concern</th>
<th>Possible effect on Literacy and Comprehension</th>
</tr>
</thead>
<tbody>
<tr>
<td>Limited general fund of knowledge</td>
<td>Understands less</td>
</tr>
<tr>
<td>Narrow focus of interest/knowledge</td>
<td>Generalization of info may be difficult</td>
</tr>
<tr>
<td>Exposure and then repeated exposure to a narrow range of topics</td>
<td>General reading materials less motivating and interesting, socialization impacted</td>
</tr>
<tr>
<td>Restricted or repetitive play, leisure, or academic activities</td>
<td>World, word and social understanding impacted results in decreased flexible thinking</td>
</tr>
<tr>
<td>Reading as a restricted and repetitive activity</td>
<td>Isolation results in decreased social understanding and application to materials</td>
</tr>
<tr>
<td>Literal, specific, and concrete understanding</td>
<td>Generalization and imagination may be limited and impact understanding</td>
</tr>
<tr>
<td>Restricted focus</td>
<td>Difficulty with multiple meaning words</td>
</tr>
<tr>
<td>Over-selective attention</td>
<td>Shifting focus or attend to multiple details</td>
</tr>
<tr>
<td>Self stimulatory behaviors</td>
<td>Limits engagement in reading activities</td>
</tr>
</tbody>
</table>
What Can You Do With Digital Text?

- Text-to-Speech
- Size
- Spacing
- Alternate Access
- Summarize
- Background
- Color
- Reading Level
- Highlight

Digital Text can be Found in Many Places

- e-mail
- Download it
- WWW (html)
- Create it
- Textbook CDs
- PDFs
http://www.nimac.us/

Text books published prior to 2006 may not be available
### SETT Framework

- Student
- Environment
- Task (what is the purpose?)
  - Connected to the standards
  - Need identified in the IEP
  - ID of weak skills through formative assessment
- Tool
Jonah

- Third grader in general education setting
- Enjoys electronic media
- Uses iPad at school for recreation and leisure
- Excels in math computation
- Good word recognition and spelling but has difficulty understanding the true meaning of many vocabulary words
- Struggles with sequencing, listening capacity, cause-effect, interpreting, predicting, summarizing and making inferences
- Tends to keep to himself in social situations

Environments

- 3rd grade general education classroom
- 24 students in the class
- Students sit at tables (4 students per table)
- Jonah sits at table next to teacher’s desk
- Attends small group social skills lesson once a week for 30 minutes with SLP/Guidance Counselor
Tasks

• Can share own point of view and identify how it is different from that of the narrator or characters.
• Describe the relationship between events, steps and ideas in a text, using time, sequence, and cause/effect language.
• Follow conversational rules (i.e. listening to other, taking turns and speaking one at a time)

Matching Features to Student Needs

<table>
<thead>
<tr>
<th>Needs</th>
<th>Features</th>
</tr>
</thead>
<tbody>
<tr>
<td>Describe the relationship between events, steps and ideas in a text, using time, sequence, and cause/effect language.</td>
<td>Graphic organizers</td>
</tr>
<tr>
<td>Can share own point of view and identify how it is different from that of the narrator or characters.</td>
<td>Embedded notes and prompts within a story Highlighting of key points in books</td>
</tr>
<tr>
<td>Understand meaning of vocabulary words in text</td>
<td>Picture/video dictionaries</td>
</tr>
<tr>
<td>Follow conversational rules (i.e. listening to other, taking turns and speaking one at a time)</td>
<td>Video Modeling</td>
</tr>
</tbody>
</table>
Tools for Trial

- Picture View: Students create maps, diagrams, and webs.
- Math View: Students use visual math tools to understand essential math concepts.
- Writing View: Students expand their ideas into written expression.

http://www.inspiration.com/
Reading/Writing Software

- **Read&Write GOLD**

- LSG products wynn.asp

- SOLO
  - [http://donjohnston.com/solo/#.UvpmuF6prGs](http://donjohnston.com/solo/#.UvpmuF6prGs)

- Kurzweil 3000

Embedded Notes

- Bubble Notes
  - Kurzweil 3000
  - [http://youtu.be/6TJIpZKlasQ](http://youtu.be/6TJIpZKlasQ)
Highlighter Feature with Extraction

Highlighting and Collect Highlights-Read and Write Gold
http://www.youtube.com/watch?v=Hv_OWdFlc20&feature=share&list=PLD2510358B7CFD5A5&index=1

Picture Supported Dictionary

Picture Dictionary-Read Write Gold
http://youtu.be/8Nf0KZEKYrA
Vocabulary Support

Vocabulary List Builder
http://www.youtube.com/watch?v=2lq8UjZS06E&list=PL942D07588DD28062&feature=share

GCF Vocabulary Videos
http://www.gcflearnfree.org/
Video Modeling-Apps

My Pictures Talk
Grembe

UDL Book Builder Editions by CAST

Gus's Rainforest Adventure
Written by Jonicas Marinos, Megan Hunt, Connie Reed, Tony Faro, and Helen Vigo from the Davis School in Scituate, MA
Illustrated by Melissa Claire Henry

http://bookbuilder.cast.org
Jada

- Seventh grader
- Enjoys listening to music and dancing
- Likes animated movies
- Limited verbal language
- Fine motor limitations and no standard keyboard access
- Cognitively delayed
- Behavior and engagement are communication modes
- Auditorily sensitive
- No word recognition
- Hits, screams, bangs head and throws objects when frustrated

Environments

- Resource room for language arts and math
- 12 students, one special education teacher, two paraprofessionals
- Attends social studies, science, all related arts classes in general education setting with shared paraprofessional
- Receives speech and language therapy once a week for 42 minutes in resource room
- Receives occupational therapy once a week for 42 minutes in resource room or related arts class when applicable
Tasks

- Determine the meaning of words and phrases in text
- Compare and contrast a text to other media versions of text content
- Read and comprehend science/technical texts independently and proficiently.

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<table>
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<th>Needs</th>
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<tbody>
<tr>
<td>Fine motor support to show what she knows</td>
<td>Alternate access (touch screen vs expanded keyboard)</td>
</tr>
<tr>
<td>Read and comprehend science/technical texts independently and proficiently.</td>
<td>Alternate access software that includes the features of embedding video presentation of content, picture supported text, text-to-speech with highlighting, expanded keyboard access, custom layouts/content of supporting activities)</td>
</tr>
<tr>
<td>Compare and contrast a text to other media versions of text content</td>
<td>See above features</td>
</tr>
<tr>
<td>Determine the meaning of words and phrases in text</td>
<td>Picture supports of words and content</td>
</tr>
<tr>
<td>Communication support that are durable due to destructive bxs to show what she knows, to comments, request, etc.</td>
<td>AAC, cells, voice output vs no voice output d/t/ auditory sensitivities, Picture supports of vocabulary</td>
</tr>
<tr>
<td>Reduce auditory input</td>
<td>Noise cancelling devices (headphones, earbuds)</td>
</tr>
</tbody>
</table>
Tools for Trial

https://www.youtube.com/watch?v=ZouWWVyz9v8

You Tube Video of Biomes

https://www.youtube.com/watch?v=ZouWWVyz9v8
Video: Showing What You know with Symbols and Biome Activity

http://sda.doe.louisiana.gov/ResourceFiles/Literacy/Informal%20Assessment%20Using%20Symbols.wmv

Picture Supported
Digital Books and Supplemental Activities

Intellitools Classroom Suite and Intellikeys

http://www.intellitools.com/classroom-suite.html
Mid Tech Leveled Communication System with Voice Output

Tech Speak

http://amdi.net

Low Tech Content Specific Communication Board

http://fdlrsregion3curriculumvisuals.wikispaces.com/Biomes

Auditory Sensory Support

Noise Cancelling Headphones
Earbuds and sound choices
Adam

- Junior in high school
- Attends career center
- Prefers working independently
- Interested in how technology works (repair/technician)
- Literal comprehension skills are fairly good
- Detail oriented

- Deficits in working memory, organization skills, sequencing and planning and accessing relevant background knowledge
- Pragmatic skills deficits
- Verbalization skills more advanced than comprehension of

Environments

- Attends high school for required language arts and math courses
- Participates in Interactive Technology Program at career center (2 year program)
- "Case manager" connects with Adam weekly at career center
Tasks

- Answer questions or solve problems using a variety of media or formats
- Determine meaning of symbols, words and phrases when used in scientific or technical context
- Follow multistep procedures in experiments, measurements, etc. and analyze results

Matching Features to Student Needs

<table>
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</thead>
<tbody>
<tr>
<td>Mobile solutions for school and work environment</td>
<td>Mobile technologies</td>
</tr>
<tr>
<td>Answer questions or solve problems using a variety of media or formats</td>
<td>Google search features (reading level, types of searches, etc), Skype/Facetime, Voice Thread, Prizmo,</td>
</tr>
<tr>
<td>Determine meaning of symbols, words and phrases when used in scientific or technical context</td>
<td>Dictionary support, homophones, Confusable words in DJ or RWG</td>
</tr>
<tr>
<td>Organizational skills support</td>
<td>Outlining Software DJ</td>
</tr>
<tr>
<td>Follow multistep procedures in experiments, measurements, etc. and analyze results</td>
<td>Siri-“tell me the definition of.....</td>
</tr>
<tr>
<td>Pragmatic skills support</td>
<td>Video Modeling -VoiceThread</td>
</tr>
</tbody>
</table>
Tools for Trial

Electronic File Management Systems
Full Featured Reading/Writing Software


http://www.texthelp.com/North-America/our-products/readwrite


Google Search Reading Levels
Web Site Visual Simplification

Safari Reader

Firefox Readability Extension and App

http://www.apple.com/safari
http://www.readability.com

Prizmo

http://youtu.be/-kM1SO_6BfQ
Merriam-Webster Dictionary

Siri
Apple iOS
You Tube Tutorials

https://www.youtube.com/watch?v=GHIoD6zECsM

Assessment Tool for Technology Based Reading Accommodations

http://aim.cast.org/experience/decision-making_tools/aim_navigator

Questions?